

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Husein Alshamirak Examiner #: 79576 Date: 3/30/04
 Art Unit: 2621 Phone Number 30 6-4049 Serial Number: 09/786,823
 Mail Box and Bldg/Room Location: PK1-4B18 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

 Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Watermarking of Digital Images using Wavelet and Discrete Cosine
 Inventors (please provide full names): see - attachment for names

Earliest Priority Filing Date: 9/10/1998

For Sequence Searches Only Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

Wavelet image
 DCT or (discrete cosine transform) watermark
 (watermarking or steganography)
 - Claim 1 terminology

STAFF USE ONLY

Searcher: Vamsi Kalakuntla

Searcher Phone #: 703 306 0254

Searcher Location: PK2 3C03

Date Searcher Picked Up: 04/01/04

Date Completed: 04/01/04

Searcher Prep & Review Time: _____

Clerical Prep Time: _____

Online Time: _____

Type of Search

NA Sequence (#) _____

AA Sequence (#) _____

Structure (#) _____

Bibliographic ☒ _____

Litigation _____

Fulltext ☒ _____

Patent Family _____

Other _____

Vendors and cost where applicable

STN _____

Dialog _____

Questel/Orbit _____

Dr.Link _____

Lexis/Nexis _____

Sequence Systems _____

WWW/Internet _____

Other (specify) _____

File 344:Chinese Patents Abs Aug 1985-2004/Mar
(c) 2004 European Patent Office
File 347:JAPIO Nov 1976-2003/Nov(Updated 040308)
(c) 2004 JPO & JAPIO
File 348:EUROPEAN PATENTS 1978-2004/Mar W03
(c) 2004 European Patent Office
File 349:PCT FULLTEXT 1979-2002/UB=20040325,UT=20040318
(c) 2004 WIPO/Univentio
File 350:Derwent WPIX 1963-2004/UD,UM &UP=200419
(c) 2004 Thomson Derwent

Set	Items	Description
S1	63331	AU=(CHOI, J? OR CHOI J? OR KIM, J? OR KIM J? OR CHO, J? OR CHO J? OR LEE, H? OR LEE H?) OR CO=MARKANY
S2	814785	DIGITAL OR DIGITI? OR BINARY
S3	1220	S1 AND (WATERMARK? OR WATER()MARK? OR MESSAGE? OR COPYRIGHT(W)PROTECT? OR DIGITAL(3N) (FINGERPRINT? OR FINGER(W)PRINT?) - OR (ID OR IDS OR IDENTIFIER? ?) (5N)S2 OR STEGANOGRAPH? OR STEGANO()GRAPH?)
S4	27	S3(S) (WAVELET? ? OR WAVE()LET? ? OR DCT OR DISCRETE()COSINE() TRANSFORM)
S5	27	IDPAT (sorted in duplicate/non-duplicate order)
S6	21	IDPAT (primary/non-duplicate records only)
S7	19	S6 AND AD=19980910:20020101/PR
S8	3	S6 AND AD=20020101:20040331/PR
S9	0	S6 NOT (S7 OR S8)
S10	1	S6 AND AD=19980910/PR
S11	112	S1 AND IC=G06K-009/00
S12	7	S11 AND S3
S13	7	IDPAT (sorted in duplicate/non-duplicate order)
S14	7	IDPAT (primary/non-duplicate records only)
S15	5	S14 AND AD=19980910:20020101/PR
S16	2	S14 AND AD=20020101:20040331/PR
S17	0	S14 NOT (S15 OR S16)

10/3,K/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.

013156655 **Image available**
WPI Acc No: 2000-328527/200028
XRPX Acc No: N00-247308

Watermarking method for digital image using wavelet and discrete cosine transformations involves transforming digital image using wavelet transformation and watermark using discrete cosine transformation

Patent Assignee: CHO J S (CHOJ-I); CHOI J U (CHOI-I); KIM J W (KIMJ-I); LEE H H (LEE-H-I); LEE S K (LEES-I); MARKANY INC (MARK-N); TRUSTECH JH (TRUS-N); CHOI J W (CHOI-I)

Inventor: CHO J S; CHOI J U; KIM J W; LEE H H; CHOI J W

Number of Countries: 089 Number of Patents: 010

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 200016516	A1	20000323	WO 99US20649	A	19990910	200028 B
AU 9960311	A	20000403	AU 9960311	A	19990910	200034
KR 99044818	A	19990625	KR 9837273	A	19980910	200036
KR 99046183	A	19990705	KR 9837274	A	19980910	200037
EP 1112636	A1	20010704	EP 99969197	A	19990910	200138
			WO 99US20649	A	19990910	
KR 2001079788	A	20010822	KR 2001703138	A	20010310	200213
KR 285077	B	20010315	KR 9837274	A	19980910	200216
KR 289365	B	20010502	KR 9837273	A	19980910	200221
CN 1325577	A	20011205	CN 99813122	A	19990910	200223
JP 2003505895	W	20030212	WO 99US20649	A	19990910	200321
			JP 2000570934	A	19990910	

Priority Applications (No Type Date): KR 9837274 A 19980910; KR 9837273 A 19980910

Patent Details:

Patent No Kind Lan Pg Main IPC Filing Notes

WO 200016516 A1 E 37 H04L-009/00

Designated States (National): AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZA ZW

Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ UG ZW

AU 9960311 A Based on patent WO 200016516

KR 99044818 A H04N-007/30

KR 99046183 A H04N-007/24

EP 1112636 A1 E H04L-009/00 Based on patent WO 200016516

Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI

KR 2001079788 A H04N-007/24

KR 285077 B H04N-007/24 Previous Publ. patent KR 99046183

KR 289365 B H04N-007/243 Previous Publ. patent KR 99044818

CN 1325577 A H04L-009/00

JP 2003505895 W 33 H04N-001/387 Based on patent WO 200016516

Watermarking method for digital image using wavelet and discrete cosine transformations involves transforming digital image using wavelet transformation and watermark using discrete cosine transformation

Abstract (Basic):

... The method involves transforming a digital image using a wavelet transformation, and a watermark using discrete cosine transformation. The discrete cosine transformed watermark is then integrated with the wavelet transformed digital image to generate a watermark embedded image.

... The figure shows the flowchart of watermarking method for digital image using wavelet and discrete cosine transformations...

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File 344:Chinese Patents Abs Aug 1985-2004/Mar
(c) 2004 European Patent Office
File 347:JAPIO Nov 1976-2003/Nov(Updated 040308)
(c) 2004 JPO & JAPIO
File 350:Derwent WPIX 1963-2004/UD,UM &UP=200419
(c) 2004 Thomson Derwent

Set	Items	Description
S1	212016	(IMAGE? ? OR PICTURE? ? OR PHOTO? ? OR GRAPHIC? OR PHOTOGR- APH?)(5N)(DIGITAL? OR BINARY? OR OPTICAL? OR ELECTRONIC? OR - COMPUTER?) OR JPG OR JPGS OR JPEGS OR JPEG OR MPEG OR MPEGs OR GIF OR GIFS OR TIFF OR BMP
S2	2077	(WAVELET? ? OR WAVE()LET? ?)
S3	4386	DCT OR DISCRETE()COSINE()TRANSFORM
S4	548541	DIGITAL OR DIGITI? OR BINARY
S5	6354	WATERMARK? OR WATER()MARK? OR COPYRIGHT(W)PROTECT? OR DIG- ITAL(3N)(FINGERPRINT? OR FINGER(W)PRINT?) OR (ID OR IDS OR ID- ENTIFIER? ?)(5N)S4 OR STEGANOGRAPH? OR STEGANO()GRAPH?
S6	1	S1 AND S2 AND S3 AND S5
S7	36	S2 AND S3
S8	36	IDPAT (sorted in duplicate/non-duplicate order)
S9	35	IDPAT (primary/non-duplicate records only)
S10	20	S9 AND AD=19980910:20020101/PR
S11	6	S9 AND AD=20020101:20040331/PR
S12	11	S9 NOT (S10 OR S11 OR S6)
S13	5	S12 AND (S1 OR S5)
S14	6	S12 NOT S13

6/3,K/1 (Item 1 from file: 350)
DIALOG(R) File 350:Derwent WPIX
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015207933 **Image available**
WPI Acc No: 2003-268469/200326
XRPX Acc No: N03-213305

Automated digital watermarking method e.g. for copyright protection
for digital products, involves calculating discrete transform having
several frequency bands

Patent Assignee: NAJARIAN K (NAJA-I); UNIV NORTH CAROLINA (UYNC-N)
Inventor: NAJARIAN K

Number of Countries: 101 Number of Patents: 002

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 200319464	A1	20030306	WO 2002US28217	A	20020828	200326 B
US 20030095683	A1	20030522	US 2001315223	P	20010828	200336
			US 2002134255	A	20020429	

Priority Applications (No Type Date): US 2002134255 A 20020429; US
2001315223 P 20010828

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200319464	A1	E	28	G06K-009/00	

Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA
CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN
IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ
OM PH PL PT RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN
YU ZA ZM ZW

Designated States (Regional): AT BE BG CH CY CZ DE DK EA EE ES FI FR GB
GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SK SL SZ TR TZ UG ZM ZW

US 20030095683 A1 G06K-009/00 Provisional application US 2001315223

Automated digital watermarking method e.g. for copyright protection
for digital products, involves calculating discrete transform having
several frequency bands

Abstract (Basic):

... The method involves calculating a discrete transform having
several frequency bands. Several digital **watermarks** are inserted into
the frequency bands. Each digital **watermark** has a predetermined
weight. The discrete transform has a discrete transform selected from a
group consisting of discrete **wavelet**, a **discrete cosine**
transform, and discrete Fourier transform.

... An INDEPENDENT CLAIM is included for a computer readable medium,
and an automated **watermarking** method...

...For **copyright protection** for digital products or digital
watermarking

...Embeds a digital **watermark** in both low and high frequencies of **image**
or other production, providing **digital watermark** which is resistant
to variety of attacks...

...The figure shows a functional block diagram of an embodiment of an
automated digital **watermarking** system of the invention

...Title Terms: **WATERMARK** ;

?

13/3,K/1 (Item 1 from file: 347)
DIALOG(R) File 347:JAPIO
(c) 2004 JPO & JAPIO. All rts. reserv.

06446701 **Image available**
IMAGE FORMING DEVICE AND ITS METHOD

PUB. NO.: 2000-032271 [JP 2000032271 A]
PUBLISHED: January 28, 2000 (20000128)
INVENTOR(s): FUKUHARA TAKAHIRO
KATO KEISUKE
MINAMI MASAFUMI
APPLICANT(s): SONY CORP
APPL. NO.: 10-196009 [JP 98196009]
FILED: July 10, 1998 (19980710)

ABSTRACT

... a storage medium 90 and decodes a map image 105 based thereon and gives the decoded image to an image composition section 3. Fractal transform, wavelet transform or discrete cosine transform or the like is adopted for the decoding system to configure a natural image or a complicated texture in navigation and the map image 105 is formed in a format such as a BMP form. A vector data decoding section 2 decodes an image 107 consisting of a line drawing of a road, a mark.symbol or the like ...

13/3,K/2 (Item 1 from file: 350)
DIALOG(R) File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.

014126274 **Image available**
WPI Acc No: 2001-610484/200170
Related WPI Acc No: 2001-167528; 2001-423463
XRPX Acc No: N01-455673

Image data encoding and decoding method for multimedia communication applications, involves using discrete wavelet transform which satisfies certain relations

Patent Assignee: SAMSUNG ELECTRONICS CO LTD (SMSU)
Inventor: CHANEY J; JAHANGHIR M; KAUFMAN M A
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 6275616	B1	20010814	US 9758697	P	19970912	200170 B
			US 972256	A	19971231	

Priority Applications (No Type Date): US 9758697 P 19970912; US 972256 A 19971231

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 6275616	B1	18	G06K-009/32	Provisional application	US 9758697

Image data encoding and decoding method for multimedia communication applications, involves using discrete wavelet transform which satisfies certain relations

Abstract (Basic):

... A discrete wavelet transform (DWT) which satisfies certain relations, is used for encoding and decoding the image data and facilitating a single step calculation of inverse DWT while...

... For multimedia images in digital communication...

...High quality lower definition image is provided which represents accurately the original image data by decoding DCT encoded image data using an IDWT. The image is decoded much faster and only less number of system resources are required...

13/3,K/3 (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.

013979014

WPI Acc No: 2001-463228/200150

XRPX Acc No: N01-343332

Video compression method and device - which can be used as pre-processor/post-processor of JPG image compression program to provide an even higher compression ratio

Patent Assignee: IND TECHNOLOGY RES INST (INTE-N)

Inventor: JUANG J; MA J

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
TW 393856	A	20000611	TW 94108362	A	19940907	200150 B

Priority Applications (No Type Date): TW 94108362 A 19940907

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
TW 393856	A		H04N-011/02	

... which can be used as pre-processor/post-processor of JPG image compression program to provide an even higher compression ratio

Abstract (Basic):

... image signal and a set of difference image signals, which can be separately used by users requesting different resolutions and video qualities By using a wavelet transformation technology, the input video is decomposed into a coarse image and at least one difference image group. The coarse image encoder uses the combined processing of DCT , vector quantifier VQ, and the entropy encoding. The JPEG encoding architecture or the like can replace this compression encoder processing. The difference image group encoder uses the combined encoding architecture of the scalar quantifier...

13/3,K/4 (Item 3 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.

013683315 **Image available**

WPI Acc No: 2001-167528/200117

Related WPI Acc No: 2001-423463; 2001-610484

XRPX Acc No: N01-120725

Image data processing method for digital communication, involves generating inverse discrete wavelet transform reduced image data by separately processing inverse discrete cosine transform processed image data

Patent Assignee: SAMSUNG ELECTRONICS CO LTD (SMSU)

Inventor: CHANEY J; JAHANGHIR M; KAUFMAN M A

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 6141457	A	20001031	US 9758697	P	19970912	200117 B
			US 971880	A	19971231	

Priority Applications (No Type Date): US 9758697 P 19970912; US 971880 A 19971231

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 6141457	A	19	G06K-009/36		Provisional application US 9758697

Image data processing method for digital communication, involves generating inverse discrete wavelet transform reduced image data by separately processing inverse discrete cosine transform processed image data

Abstract (Basic):

... Inverse DCT (IDCT) processed image data is generated by processing image data (302) encoded using DCT by IDCT process in a decoder (308), which is separately processed with inverse discrete wavelet transform (IDWT) to generate IDWT reduced image data. Reduced image data with relatively higher and lower definitions than IDWT reduced data and image data is...

... The image data is encoded in an encoder (304) using DCT process (306). The IDCT processed image data (316) has the same definition as image data and IDWT reduced image data has a relatively lower definition...

... For digital communications for processing high definition image to provide relatively lower definition image using discrete cosine and wavelet transforms...

... DCT process (306)

13/3,K/5 (Item 4 from file: 350)
 DIALOG(R)File 350:Derwent WPIX
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012532041 **Image available**
 WPI Acc No: 1999-338147/199929
 XRPX Acc No: N99-253475

Digital image compression method
 Patent Assignee: CANON KK (CANO); CANON INFORMATION SYSTEMS RES AUSTRALIA (CANO)

Inventor: ANDREW J P; BRADLEY A P
 Number of Countries: 001 Number of Patents: 002
 Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
AU 9887096	A	19990415	AU 9887096	A	19980928	199929 B
AU 725719	B	20001019	AU 9887096	A	19980928	200057

Priority Applications (No Type Date): AU 979515 A 19970929

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
AU 9887096	A	48	H03M-007/30		
AU 725719	B		H03M-007/30		Previous Publ. patent AU 9887096

Digital image compression method

Abstract (Basic):

... Image data is transformed, using a discrete wavelet transform, into a series of low and high frequency component sub-bands. These have

a corresponding series of coefficients which are arranged spatially in
a...

... For compressing digital data, e.g. video and image data...

... Performs well with data having sharp discontinuities in preference to
lossy heavy quantization techniques using discrete cosine
transform , e.g. JPEG .

?

14/3,K/1 (Item 1 from file: 347)
DIALOG(R)File 347:JAPIO
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06146643 **Image available**
WAVELET CONVERTER, ITS METHOD, WAVELET INVERSE CONVERTER, ITS METHOD,
IMAGE CODER, ITS METHOD, IMAGE DECODER AND ITS METHOD

PUB. NO.: 11-088183 [JP 11088183 A]
PUBLISHED: March 30, 1999 (19990330)
INVENTOR(s): ISOMURA MASAICHI
APPLICANT(s): SEIKO EPSON CORP
APPL. NO.: 09-247294 [JP 97247294]
FILED: September 11, 1997 (19970911)

WAVELET CONVERTER, ITS METHOD, WAVELET INVERSE CONVERTER, ITS METHOD,
IMAGE CODER, ITS METHOD, IMAGE DECODER AND ITS METHOD

ABSTRACT

... To reduce a work memory considerably or to eliminate the memory and to maintain the image quality to a level attained by provision of a discrete cosine transform DCT .

SOLUTION: The wavelet converter or the like is provided with a low frequency component extract means 12 that extracts a low frequency component from an input signal and...

14/3,K/2 (Item 2 from file: 347)
DIALOG(R)File 347:JAPIO
(c) 2004 JPO & JAPIO. All rts. reserv.

06018952 **Image available**
IMAGE PROCESSING SYSTEM

PUB. NO.: 10-302052 [JP 10302052 A]
PUBLISHED: November 13, 1998 (19981113)
INVENTOR(s): ONEDA SHOGO
APPLICANT(s): RICOH CO LTD [000674] (A Japanese Company or Corporation), JP (Japan)
APPL. NO.: 09-120298 [JP 97120298]
FILED: April 23, 1997 (19970423)

ABSTRACT

...SOLUTION: Inputted color image data are wavelet transformed in a wavelet transformation part 1 for respective color components. After the respective processings corresponding to the transformation in a filter, color matching and .gamma. correction part 2, a wavelet transformed wavelet coefficient is inversely transformed in a wavelet inverse transformation part 3 and outputted. Also, though the similar processing is possible even when the wavelet transformation is replaced with other orthogonal transformation (DCT or the like), the wavelet transformation is realized by an arithmetic operation and the side effects of block distortion/mosquito noise, etc., are hardly generated. Thus, the computation amount of...

14/3,K/3 (Item 3 from file: 347)
DIALOG(R)File 347:JAPIO

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05646840 **Image available**
IMAGE CODER

PUB. NO.: 09-261640 [JP 9261640 A]
PUBLISHED: October 03, 1997 (19971003)
INVENTOR(s): GO YUKIO
APPLICANT(s): OKI ELECTRIC IND CO LTD [000029] (A Japanese Company or
 Corporation), JP (Japan)
APPL. NO.: 08-066047 [JP 9666047]
FILED: March 22, 1996 (19960322)

ABSTRACT

...SOLUTION: A received image signal s10 is given to a discrete cosine transformation(DCT) means 21 and a wavelet transformation (WLT) means 11 and outputted to a code quantity comparison means 15 via 1st and 2nd scanning means 22, 12 connecting respectively to the DCT means 21 and the WLT means 11, 1st and 2nd quantization means 23, 13, and 1st and 2nd coding means 24, 14. The code quantity...

14/3,K/4 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.

011482255 **Image available**
WPI Acc No: 1997-460160/199743
XRPX Acc No: N97-383151

Switched filterbank encoding method for audio signals - involving
monitoring stationarity of input signal and switching between wavelet
filtering and modified discrete cosine transforms
Patent Assignee: LUCENT TECHNOLOGIES INC (LUCE)
Inventor: JOHNSTON J D; SINHA D
Number of Countries: 008 Number of Patents: 007
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
EP 797313	A2	19970924	EP 97301655	A	19970312	199743 B
CA 2199070	A	19970919	CA 2199070	A	19970304	199815
JP 10039897	A	19980213	JP 9765783	A	19970319	199817
KR 97067255	A	19971013	KR 9710242	A	19970319	199843
US 5852806	A	19981222	US 9614725	P	19960319	199907
			US 96720757	A	19961001	
CA 2199070	C	20010515	CA 2199070	A	19970304	200131
JP 3418305	B2	20030623	JP 9765783	A	19970319	200341

Priority Applications (No Type Date): US 96720757 A 19961001; US 9614725 P 19960319

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 797313	A2	E	12	H04B-001/66	
Designated States (Regional): DE FR GB IT					
CA 2199070	A			H03M-007/30	
JP 10039897	A		12	G10L-007/04	
KR 97067255	A			G11B-020/10	
US 5852806	A			G10L-009/00	Provisional application US 9614725
CA 2199070	C	E		G10L-003/02	
JP 3418305	B2		11	G10L-019/02	Previous Publ. patent JP 10039897

... involving monitoring stationarity of input signal and switching
between wavelet filtering and modified discrete cosine transforms

...Abstract (Basic): entropy encoded (214) in a conventional manner. The signal is coded using two separate filter banks. One filter bank uses a high frequency resolution modified **discrete cosine transform** (204) (MDCT), while the other uses a **wavelet filterbank**...

...conventional manner. Only long windows are used by this filterbank, with no switching to the short windows. The non-stationary signals are coded using the **wavelet filterbank**...

14/3,K/5 (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.

011251716 **Image available**
WPI Acc No: 1997-229619/199721
Related WPI Acc No: 2000-248621
XRPX Acc No: N97-189824

Video data compression apparatus - has filter for frequency separating detected image activity values, using smoothed image activity values to control quantisation levels applied to frequency separated data

Patent Assignee: SONY UK LTD (SONY); SONY CORP (SONY)

Inventor: GILLARD C H; STONE J J

Number of Countries: 003 Number of Patents: 005

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
GB 2306832	A	19970507	GB 9522171	A	19951030	199721 B
JP 9163371	A	19970620	JP 96273623	A	19961016	199735
GB 2306832	B	20000329	GB 9522171	A	19951030	200019
US 6614941	B1	20030902	US 96721623	A	19960926	200359
JP 3493103	B2	20040203	JP 96273623	A	19961016	200410

Priority Applications (No Type Date): GB 9522171 A 19951030

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
GB 2306832	A		21	H04N-007/50	
JP 9163371	A		10	H04N-007/30	
GB 2306832	B			H04N-007/50	
US 6614941	B1			G06K-009/36	
JP 3493103	B2		10	H04N-007/30	Previous Publ. patent JP 9163371

...Abstract (Basic): The video compression apparatus segments images into blocks and applies transforms and quantisation for video compression. The system can use **DCT**, sub-band or **wavelet** transformations to apply frequency transformations. The input video (50) is applied to the transform system (70) that generates the transformed data into a frame store...

...USE/ADVANTAGE - Esp. for video compression using **wavelet** based transform method. Avoids artifacts in decompressed images resulting from quantisation effects between adjacent blocks...

14/3,K/6 (Item 3 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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009603314
WPI Acc No: 1993-296862/199338

XRPX Acc No: N93-228818

Image Processing appts. for picture data encoding and compression -
applies discrete cosine transformation to picture data blocks not
containing edges but wavelet e.g. Haar transformation to blocks with
edges

Patent Assignee: SONY CORP (SONY)

Inventor: SAKAMOTO T

Number of Countries: 005 Number of Patents: 006

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
EP 561593	A2	19930922	EP 93301949	A	19930315	199338 B
JP 6046404	A	19940218	JP 9370803	A	19930305	199412
US 5398067	A	19950314	US 9331966	A	19930316	199516
EP 561593	A3	19940810	EP 93301949	A	19930315	199530
EP 561593	B1	19970716	EP 93301949	A	19930315	199733
DE 69312132	E	19970821	DE 612132	A	19930315	199739
			EP 93301949	A	19930315	

Priority Applications (No Type Date): JP 9292077 A 19920317

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
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EP 561593	A2	E	15		
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Designated States (Regional): DE FR GB

US 5398067	A		14		
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EP 561593	B1	E	16		
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Designated States (Regional): DE FR GB

DE 69312132	E				Based on patent EP 561593
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... applies discrete cosine transformation to picture data blocks not
containing edges but wavelet e.g. Haar transformation to blocks with
edges

...Abstract (Basic): to a video conferencing system, the presence or
absence of an edge within a picture data block is detected. In the
absence of any edges, discrete cosine transform coding is applied
to that block for coding before transmission. When an edge is found to
exist within a data block, the wavelet e.g. Haar transformation is
applied instead...

...Abstract (Equivalent): A picture data processing apparatus which
transmits inputted picture data after encoding said data block by
block, comprising: transforming means (8) comprising discrete cosine
transform means (14) for discrete cosine transforming said picture
data, characterised by edge detection means (8, 10) for detecting
presence or absence of an edge in said each block; and in that the
transforming means (8) further comprises Wavelet transform means (16)
for Wavelet transforming said picture data, and in that the
transforming means (8) is responsive to the edge detection means (8,
10) to transform the picture data for said each block by the discrete
cosine transform means (14) when there is no edge and by the
Wavelet transform means (16) when there is an edge...

...Abstract (Equivalent): A wavelet transformer wavelet transforms each
one of the blocks of the picture data, when the presence of an edge is
detected by the edge detector. The wavelet transformer is comprised
of a Haar transformer to Haar transform each one of the blocks of the
picture data...

?

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(c) 2004 Elsevier Eng. Info. Inc.
File 34:SciSearch(R) Cited Ref Sci 1990-2004/Mar W3
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File 35:Dissertation Abs Online 1861-2004/Feb
(c) 2004 ProQuest Info&Learning
File 65:Inside Conferences 1993-2004/Mar W4
(c) 2004 BLDSC all rts. reserv.
File 94:JICST-EPlus 1985-2004/Mar W2
(c) 2004 Japan Science and Tech Corp (JST)
File 95:TEME-Technology & Management 1989-2004/Mar W2
(c) 2004 FIZ TECHNIK
File 99:Wilson Appl. Sci & Tech Abs 1983-2004/Feb
(c) 2004 The HW Wilson Co.
File 144:Pascal 1973-2004/Mar W3
(c) 2004 INIST/CNRS
File 233:Internet & Personal Comp. Abs. 1981-2003/Sep
(c) 2003 EBSCO Pub.
File 239:Mathsci 1940-2004/May
(c) 2004 American Mathematical Society
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
(c) 1998 Inst for Sci Info
File 583:Gale Group Globalbase(TM) 1986-2002/Dec 13
(c) 2002 The Gale Group
File 603:Newspaper Abstracts 1984-1988
(c) 2001 ProQuest Info&Learning
File 483:Newspaper Abs Daily 1986-2004/Mar 31
(c) 2004 ProQuest Info&Learning
File 248:PIRA 1975-2004/Mar W3
(c) 2004 Pira International

Set	Items	Description
S1	576486	(IMAGE? ? OR PICTURE? ? OR PHOTO? ? OR GRAPHIC? OR PHOTOGRAPH?) (5N) (DIGITAL? OR BINARY? OR OPTICAL? OR ELECTRONIC? OR - COMPUTER?) OR JPG OR JPGS OR JPEGs OR JPEG OR MPEG OR MPEGs OR GIF OR GIFS OR TIFF OR BMP
S2	91502	(WAVELET? ? OR WAVE()LET? ?)
S3	19200	DCT OR DISCRETE()COSINE()TRANSFORM
S4	1839989	DIGITAL OR DIGITI? OR BINARY
S5	17372	WATERMARK? OR WATER()MARK? OR COPYRIGHT(W)PROTECT? OR DIGITAL(3N) (FINGERPRINT? OR FINGER(W)PRINT?) OR (ID OR IDS OR IDENTIFIER? ?) (5N) S4 OR STEGANOGRAPH? OR STEGANO()GRAPH?
S6	74	S1 AND S2 AND S3 AND S5
S7	48	RD S6 (unique items)
S8	10	S7 NOT PY>1998
S9	142	S2 AND S3 AND S5
S10	81	RD S9 (unique items)
S11	11	S10 NOT PY>1998
S12	1	S11 NOT S8
S13	137840	AU=(CHOI, J? OR CHOI J? OR KIM, J? OR KIM J? OR CHO, J? OR CHO J? OR LEE, H? OR LEE H?) OR CO=MARKANY
S14	5	S13 AND S1 AND S2 AND S3
S15	4	RD S14 (unique items)
S16	3	S15 NOT PY>1998

8/3,K/1 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC
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6195152 INSPEC Abstract Number: B1999-04-6135C-152, C1999-04-5260B-256
Title: The effect of matching watermark and compression transforms in compressed color images
Author(s): Wolfgang, R.B.; Podilchuk, C.I.; Delp, E.J.
Author Affiliation: Sch. of Electr. Eng., Purdue Univ., West Lafayette, IN, USA
Conference Title: Proceedings 1998 International Conference on Image Processing. ICIP98 (Cat. No.98CB36269) Part vol.1 p.440-4 vol.1
Publisher: IEEE Comput. Soc, Los Alamitos, CA, USA
Publication Date: 1998 Country of Publication: USA 3 vol. (lxxi+962+984+1013) pp.
ISBN: 0 8186 8821 1 Material Identity Number: XX-1998-01745
U.S. Copyright Clearance Center Code: 0 8186 8821 1/98/\$10.00
Conference Title: Proceedings of IPCIP'98 International Conference on Image Processing
Conference Sponsor: IEEE Signal Process. Soc
Conference Date: 4-7 Oct. 1998 Conference Location: Chicago, IL, USA
Language: English
Subfile: B C
Copyright 1999, IEE

Title: The effect of matching watermark and compression transforms in compressed color images

Abstract: The growth of networked multimedia systems has complicated copyright enforcement relative to digital images. One way to protect the copyright of digital images is to add an invisible structure to the image (known as a digital watermark) to identify the owner. In particular, it is important for Internet and image database applications that as much of the watermark as possible remain in the image after compression. Image adaptive watermarks are particularly resistant to removal by signal processing attack such as filtering or compression. Common image adaptive watermarks operate in the transform domain (DCT or wavelet); the same domains are also used for popular image compression techniques (JPEG, EZW). This paper investigates whether matching the watermarking domain to the compression transform domain will make the watermark more robust to compression.

...Descriptors: wavelet transforms

...Identifiers: digital images; copyright protection; ...

...digital watermark; ...

...image adaptive watermarks; ...

... DCT; wavelet; ...

... JPEG; ...

...color embedded zero-tree wavelet

8/3,K/2 (Item 2 from file: 2)
DIALOG(R)File 2:INSPEC
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5914465 INSPEC Abstract Number: B9806-6140C-489, C9806-1250-237
Title: Image-adaptive watermarking using visual models
Author(s): Podilchuk, C.I.; Wenjun Zeng

Author Affiliation: Lucent Technol., Bell Labs., Murray Hill, NJ, USA
Journal: IEEE Journal on Selected Areas in Communications vol.16, no.4
p.525-39
Publisher: IEEE,
Publication Date: May 1998 Country of Publication: USA
CODEN: ISACEM ISSN: 0733-8716
SICI: 0733-8716(199805)16:4L:525:IAWU;1-C
Material Identity Number: D958-98004
U.S. Copyright Clearance Center Code: 0733-8716/98/\$10.00
Language: English
Subfile: B C
Copyright 1998, IEE

Title: Image-adaptive watermarking using visual models

...Abstract: faced with the challenge of how to protect their electronic data. This problem has generated a flurry of research activity in the area of digital **watermarking** of electronic content for **copyright protection**. The challenge here is to introduce a digital **watermark** that does not alter the perceived quality of the electronic content, while being extremely robust to attack. For instance, in the case of image data, editing the picture or illegal tampering should not destroy or transform the **watermark** into another valid signature. Equally important, the **watermark** should not alter the perceived visual quality of the image. From a signal processing perspective, the two basic requirements for an effective **watermarking** scheme, robustness and transparency, conflict with each other. We propose two **watermarking** techniques for **digital images** that are based on utilizing visual models which have been developed in the context of image compression. Specifically, we propose **watermarking** schemes where visual models are used to determine image dependent upper bounds on **watermark** insertion. This allows us to provide the maximum strength transparent **watermark** which, in turn, is extremely robust to common image processing and editing such as **JPEG** compression, rescaling, and cropping. We propose perceptually based **watermarking** schemes in two frameworks: the block-based **discrete cosine transform** and multiresolution **wavelet** framework and discuss the merits of each one. Our schemes are shown to provide very good results both in terms of image transparency and robustness.

...Descriptors: **wavelet transforms**

Identifiers: image-adaptive **watermarking** ; ...

...digital **watermarking** ; **copyright protection** ; ...

... **watermark** insertion...

...transparent **watermark** ; ...

... **JPEG** compression...

...block-based **discrete cosine transform** ; ...

...multiresolution **wavelet** ;

8/3,K/3 (Item 3 from file: 2)

DIALOG(R)File 2:INSPEC

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5888949 INSPEC Abstract Number: B9805-6140C-632, C9805-1250-308

Title: A multiresolution watermark for digital images

Author(s): Xiang-Gen Xia; Boncelet, C.G.; Arce, G.R.

Author Affiliation: Dept. of Electr. Eng., Delaware Univ., Newark, DE,

USA

Conference Title: Proceedings. International Conference on Image Processing (Cat. No.97CB36144) Part vol.1 p.548-51 vol.1
Publisher: IEEE Comput. Soc, Los Alamitos, CA, USA
Publication Date: 1997 Country of Publication: USA 3 vol.
(l1i+951+892+748) pp.

ISBN: 0 8186 8183 7 Material Identity Number: XX97-00465

U.S. Copyright Clearance Center Code: 0 8186 8183 7/97/\$10.00

Conference Title: Proceedings of International Conference on Image Processing

Conference Sponsor: IEEE Signal Process. Soc

Conference Date: 26-29 Oct. 1997 Conference Location: Santa Barbara, CA, USA

Language: English

Subfile: B C

Copyright 1998, IEE

Title: A multiresolution watermark for digital images

Abstract: We introduce a new multiresolution watermarking method for digital images. The method is based on the discrete wavelet transform (DWT). Pseudo-random codes are added to the large coefficients at the high and middle frequency bands of the DWT of an image. It is shown that this method is more robust to often proposed methods to some common image distortions, such as the wavelet transform based image compression, and image halftoning. Moreover, the method is hierarchical. The computation load needed to detect the watermark depends on the noise level in an image.

...Descriptors: wavelet transforms

Identifiers: digital images ; ...

...discrete wavelet transform...

...multiresolution watermarking method...

... wavelet transform based image compression...

... copyright protection ; ...

... DCT approach

8/3,K/4 (Item 1 from file: 6)

DIALOG(R) File 6:NTIS

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1973523 NTIS Accession Number: DE96012173

Data embedding method

Sandford, M. T. ; Bradley, J. N. ; Handel, T. G.

Los Alamos National Lab., NM.

Corp. Source Codes: 072735000; 9512470

Sponsor: Department of Energy, Washington, DC.

Report No.: LA-UR-96-1770

1996 35p

Languages: English

Journal Announcement: GRAI9623; ERA9645

Sponsored by Department of Energy, Washington, DC.

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NTIS Prices: PC A04/MF A01

Data embedding is a new **steganographic** method for combining digital information sets. This paper describes the data embedding method and gives examples of its application using software written in the C...
... data embedding in an application for digital imagery. Information is embedded into, and extracted from, Truecolor or color-pallet images in Microsoft(reg sign) bitmap (. **BMP**) format. Hiding data in the noise component of a host, by means of an algorithm that modifies or replaces the noise bits, is termed (open quote) **steganography** .(close quote) Data embedding differs markedly from conventional **steganography** , because it uses the noise component of the host to insert information with few or no modifications to the host data values or their statistical...

... The data embedding method applies to host data compressed with transform, or (open quote)lossy(close quote) compression algorithms, as for example ones based on **discrete cosine transform** and **wavelet** functions. Analysis of the host noise generates a key required for embedding and extracting the auxiliary data from the combined data. The key is stored...

Descriptors: **Image** processing; * **Digital** data; *Embedded systems; *Cryptography; Algorithms; Remote sensing; Noise; Security; Signatures

8/3,K/5 (Item 1 from file: 94)
DIALOG(R)File 94:JICST-EPlus
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04855533 JICST ACCESSION NUMBER: 98A0338430 FILE SEGMENT: JICST-E
Digital Watermarking Technologies and the Application to Contents Protection.

Denshi Joho Tsushin Gakkai Taikai Koen Ronbunshu(Proceedings of the IEICE General Conference (Institute of Electronics, Information and Communication Engineers), 1998, VOL.1998,sogo 6, PAGE.430-431, FIG.4, REF.7

JOURNAL NUMBER: G0508AEP
UNIVERSAL DECIMAL CLASSIFICATION: 681.3:621.397.3 681.3.02-759
LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Conference Proceeding
ARTICLE TYPE: Commentary
MEDIA TYPE: Printed Publication

Digital Watermarking Technologies and the Application to Contents Protection.

DESCRIPTORS: **digital image** ; ...

... DCT (transform...

... wavelet transform

8/3,K/6 (Item 2 from file: 94)
DIALOG(R)File 94:JICST-EPlus
(c)2004 Japan Science and Tech Corp(JST). All rts. reserv.

03901394 JICST ACCESSION NUMBER: 99A0098034 FILE SEGMENT: JICST-E
Improvement of Digital Watermarking under Frequency Domain For Enhancement of Resistance to Geometric Transformation Attacks.

TANAKA HIROYUKI (1); NAKAJIMA MASAOMI (1)

(1) Nttdata

Joho Shori Gakkai Kenkyu Hokoku, 1998, VOL.98,NO.108(CSEC-3), PAGE.37-42,

FIG.5, TBL.2, REF.3
JOURNAL NUMBER: Z0031BAO ISSN NO: 0919-6072
UNIVERSAL DECIMAL CLASSIFICATION: 621.391
LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Journal
ARTICLE TYPE: Original paper
MEDIA TYPE: Printed Publication

**Improvement of Digital Watermarking under Frequency Domain For
Enhancement of Resistance to Geometric Transformation Attacks.**

ABSTRACT: Digital watermarks embedded to digital images are often invalidated by geometric transformation attacks as scaling and clipping. Digital watermarks that use methods of frequency analysis as DCT, FFT, and wavelet transformation tend to preserve quality of images after embedding digital watermarks, but usually can be invalidated by geometric transformation attacks. Other type of digital watermarks that is embedded by changing sampled value as brightness of pixel for the value which contains information of digital watermark tends to cause quality of images to be worse but usually has resistance to geometric transformation attacks. We propose a digital watermarking method that is improved for enhancement of resistance to geometric transformation attacks and can preserve quality of image after embedding digital watermark by combination of digital watermarking method using DCT and another method which changes sampled value as brightness of pixel. (author abst.)

8/3,K/7 (Item 3 from file: 94)
DIALOG(R)File 94:JICST-EPlus
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03713330 JICST ACCESSION NUMBER: 98A0648682 FILE SEGMENT: JICST-E
**Digital watermarking and problems. Last resort for copyright
protection !?**
YAMANAKA KIYOSHI (1)
(1) Nippon Telegr. and Teleph. Corp.
Gazo Rabo, 1998, VOL.9,NO.7, PAGE.5-8, FIG.4, REF.8
JOURNAL NUMBER: L2340AAI ISSN NO: 0915-6755
UNIVERSAL DECIMAL CLASSIFICATION: 681.3.02-759 681.3:347.77
LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Journal
ARTICLE TYPE: Commentary
MEDIA TYPE: Printed Publication

**Digital watermarking and problems. Last resort for copyright
protection !?**
DESCRIPTORS: digital image ; ...
... DCT (transform...
... wavelet transform

8/3,K/8 (Item 4 from file: 94)
DIALOG(R)File 94:JICST-EPlus
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03523311 JICST ACCESSION NUMBER: 98A0090310 FILE SEGMENT: JICST-E
**A Security of a Watermarking for Copyright Protection Using Wavelet
Transform.**

SAKAI YASUYUKI (1); ISHIZUKA HIROKAZU (1); SAKURAI KOICHI (2)
(1) Mitsubishi Electric Corp.; (2) Kyushu Univ., Grad. Sch.
Joho Shori Gakkai Ronbunshi(Transactions of Information Processing Society
of Japan), 1997, VOL.38,NO.12, PAGE.2640-2647, FIG.10, TBL.2, REF.12
JOURNAL NUMBER: Z0778AAZ ISSN NO: 0387-5806
UNIVERSAL DECIMAL CLASSIFICATION: 681.3.02-759 681.3:621.397.3
LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Journal
ARTICLE TYPE: Original paper
MEDIA TYPE: Printed Publication

A Security of a Watermarking for Copyright Protection Using Wavelet Transform.

ABSTRACT: Conventional watermarking using wavelet transform utilizes the frequency information which is given from once and for all acting orthogonal Haar wavelet filter to original image. But it may be very weak against alteration attack of malicious user, because they could be easy to eliminate hiding information using low-pass filter. Therefore, we propose a new watermarking system based on our experiments. The system has following two features. The first is actively utilizing substantial characterisity of Multi Resolutional Representation with wavelet transform. The second is including an idea managing somehow to embed watermarking to lower frequency field. As a result of some experiments, we confirmed these effects. (author abst.)

...DESCRIPTORS: digital image ; ...

... wavelet transform...

... DCT (transform)

8/3,K/9 (Item 1 from file: 144)
DIALOG(R)File 144:Pascal
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14512924 PASCAL No.: 00-0176705
Robust image watermarking in the subband or discrete cosine transform domain
Signal processing IX : theories and applications : Rhodes, 8-11 September 1998

TZOVARAS D; KARAGIANNIS N; STRINTZIS M G
THEODORIDIS S, ed; PITAS I, ed; STOURAITIS A, ed; KALOUPSIDIS N, ed
Information Processing Laboratory, Electrical and Computer Engineering
Department, Aristotle University of Thessaloniki, Thessaloniki 540 06,
Greece
University of Athens, Greece.; Computer Technology Institute, Patras,
Greece.; European Association for Signal Processing, Lausanne, Switzerland.
Eusipco : European signal processing conference, 9 (Rhodes GRC)
1998-09-08
1998 2285-2288
Publisher: Typorama, Patras
Language: English

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Robust image watermarking in the subband or discrete cosine transform domain
In this paper a method is presented for copyright protection in digital images . Copyright protection is achieved by embedding an invisible signal, known as digital signature or watermark , in the

digital image . The method proposed in this paper casts the signature in the frequency domain by slightly modifying the values of randomly selected DC coefficients of the Discrete Cosine Transform (DCT) of the image. The same method is applied also on the Subband or Wavelet Transform coefficients. An adaptive method is proposed also based on perceptual criteria that guarantees the invisibility of the watermark and avoids the deterioration of the image. Signature detection is done via hypothesis testing, without to use any information from the original image. The watermarks embedded by the proposed method are very resistant to JPEG and other frequently used compression. Experimental results using real image data verify the effectiveness of the method.

English Descriptors: Image processing; Cryptography; Subband decomposition; Cosine transform; Discrete transformation; Digital image ; Adaptive method; Experimental result; Digital signature

French Descriptors: Traitement image; Cryptographie; Decomposition sous bande; Transformation cosinus; Transformation discrete; Image numerique; Methode adaptative; Resultat experimental; Watermarking ; Signature numerique

8/3,K/10 (Item 2 from file: 144)
DIALOG(R) File 144:Pascal
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13205970 PASCAL No.: 97-0471213
Digital image watermarking using visual models
Human vision and electronic imaging II : San Jose CA, 10-13 February 1997
24-25 April 1997
PODILCHUK C I; ZENG W
ROGOWITZ Bernice E, ed; PAPPAS Thraasyvoulos N, ed
Bell Laboratories, 600 Mountain Ave. 2D-334, Murray Hill, NJ 07974,
United States; EE Dept., Princeton University, Princeton, NJ, United States
Human vision and electronic imaging. Conference, 2 (San Jose CA USA)
1997-02-10
Journal: SPIE proceedings series, 1997, 3016 100-111
Language: English

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Digital image watermarking using visual models
... with the challenge of how to protect their electronic data. This problem has generated a flurry of recent research activity in the area of digital watermarking of electronic content for copyright protection . Unlike the traditional visible watermark found on paper, the challenge here is to introduce a digital watermark that does not alter the perceived quality of the electronic content while being extremely robust to attack. For instance, in the case of image data, editing the picture or illegal tampering should not destroy or alter the watermark . Equally important, the watermark should not alter the perceived visual quality of the image. From a signal processing viewpoint, the two basic requirements for an effective watermarking scheme, robustness and transparency, conflict with each other. We propose a watermarking technique for digital images that is based on utilizing visual models which have been developed in the context of image compression. Specifically, we propose a watermarking scheme where visual models are used to determine image dependent modulation masks for watermark insertion. In other words, for each image we can determine the maximum amount of watermark signal that each portion of the image can tolerate without affecting the visual quality

of the image. This allows us to provide the maximum strength watermark which in turn, is extremely robust to common image processing and editing such as JPEG compression, rescaling, and cropping. We have watermarking results in a DCT framework as well as a wavelet framework. The DCT framework allows the direct insertion of watermarks to JPEG-compressed data whereas the wavelet based scheme provides a framework where we can take advantage of both a local and global approach. Our scheme is shown to provide dramatic improvement...

English Descriptors: Digital image ; Internet; Telecommunication;
International network; Remote data processing; Information protection;
Electronic data interchange; Copyright; Robustness; Technique; Visual
information; Image processing; Models

?

12/3,K/1 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC
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6313708 INSPEC Abstract Number: B1999-09-6135C-089, C1999-09-5260B-221
Title: **Image protection via watermarking on perceptually significant wavelet coefficients**
Author(s): Houngh-Jyh Wang; Kuo, C.-C.J.
Author Affiliation: Integrated Media Syst. Center, Southern California Univ., Los Angeles, CA, USA
Conference Title: 1998 IEEE Second Workshop on Multimedia Signal Processing (Cat. No.98EX175) p.279-84
Editor(s): Wong, P.W.; Alwan, A.; Ortega, A.; Kuo, C.-C.J.; Nikian, C.L.M.
Publisher: IEEE, Piscataway, NJ, USA
Publication Date: 1998 Country of Publication: USA xvii+638 pp.
ISBN: 0 7803 4919 9 Material Identity Number: XX-1998-03663
U.S. Copyright Clearance Center Code: 0 7803 4919 9/98/\$10.00
Conference Title: 1998 IEEE Second Workshop on Multimedia Signal Processing
Conference Date: 7-9 Dec. 1998 Conference Location: Redondo Beach, CA, USA

Language: English
Subfile: B C
Copyright 1999, IEE

Title: **Image protection via watermarking on perceptually significant wavelet coefficients**

Abstract: A new scheme to search perceptually significant wavelet coefficients for effective digital watermark casting is proposed in this research. Unlike other watermark casting algorithms, which select a fixed set of DCT or wavelet coefficients in the frequency domain, we use an adaptive method to find significant subbands and a number of coefficients in these subbands. The resulting method is image dependent. Furthermore, the threshold of the selected subband is used as one of the energy weighting factors in the generation of a broadband watermark so that it cannot be easily damaged by frequency-selective filtering, DCT or wavelet based compression attack.

...Descriptors: wavelet transforms

...Identifiers: perceptually significant wavelet coefficients...

...digital watermark casting...

...broadband watermark

?

16/3,K/1 (Item 1 from file: 8)
DIALOG(R) File 8: Ei Compendex(R)
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04629652 E.I. No: EIP97023529288

Title: Image coding using overlapped wavelet transform with permutation scan

Author: Hur, Tae Won; Kim, Jeong Woo ; Kim, Eung Sung; Choi, Joong Han ; Lee, Keun Young

Corporate Source: Sung Kyun Kwan Univ, Kyungg-Do, S Korea

Conference Title: Proceedings of the 1996 IEEE Asia Pacific Conference on Circuits and Systems

Conference Location: Seoul, South Korea **Conference Date:** 19961118-19961121

E.I. Conference No.: 46079

Source: IEEE Asia-Pacific Conference on Circuits and Systems - Proceedings 1996. IEEE, Piscataway, NJ, USA. p 14-17

Publication Year: 1996

CODEN: 85RMAG

Language: English

Title: Image coding using overlapped wavelet transform with permutation scan

Author: Hur, Tae Won; Kim, Jeong Woo ; Kim, Eung Sung; Choi, Joong Han ; Lee, Keun Young

Abstract: In this paper, an overlapped wavelet transform (OWT) with permutation scan is presented. This transform is compared to DCT, constructed from PR-QMF-filter banks and Haar basis. Also permutation scanning achieves compression through efficiently representing the positional information caused by ordering the data information. A block OWT-based permutation coding algorithm(OWTPC) is developed and compared to JPEG. This mutually beneficial characteristics reduces the coding bit-rate. Simulation results are obtained for standard image, showing improvement of 0.2-0.3dB compared to JPEG in the peak-SNR index. (Author abstract) 5 Refs.

Descriptors: Image coding; Wavelet transforms; Digital filters; Scanning; Image compression; Algorithms; Computer simulation; Standards ; Signal to noise ratio; Signal filtering and prediction

Identifiers: Overlapped wavelet transforms; Permutation scan; Discrete cosine transforms; Coding bit rate

16/3,K/2 (Item 1 from file: 35)
DIALOG(R) File 35:Dissertation Abs Online
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01643714 ORDER NO: AAD13-89459

IMAGE COMPRESSION USING WAVELET TRANSFORM

Author: KIM, JUNG-HOON

Degree: M.S.

Year: 1998

Corporate Source/Institution: TEXAS A&M UNIVERSITY-KINGSVILLE (1187)

Source: VOLUME 36/05 of MASTERS ABSTRACTS.

PAGE 1381. 72 PAGES

IMAGE COMPRESSION USING WAVELET TRANSFORM

Author: KIM, JUNG-HOON

This thesis discusses the compression of an image using Wavelet

Transform. Images are compressed at high compression ratio (low bit rate) by using wavelet image coding in Matlab. The reconstructed images using Wavelet Transform were compared to the current image compression standard based on the Discrete Cosine Transform (DCT), called JPEG , in terms of compression ratios and qualities. Also, the compression ratios are compared among different wavelet families.

16/3,K/3 (Item 1 from file: 65)
DIALOG(R)File 65:Inside Conferences
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02601003 INSIDE CONFERENCE ITEM ID: CN027101430
H.236 + I-frame coding with a hybrid DCT / wavelet transform (3460-36)
Song, H.; Kim, J. ; Kuo, C.-C. J.
CONFERENCE: Applications of digital image processing-Conference; 21st
PROCEEDINGS-SPIE THE INTERNATIONAL SOCIETY FOR OPTICAL ENGINEERING, 1998
; ISSUE 3460 P: 320-329
SPIE, 1998
ISSN: 0277-786X ISBN: 0819429155
LANGUAGE: English DOCUMENT TYPE: Conference Papers
CONFERENCE EDITOR(S): Tescher, A. G.
CONFERENCE SPONSOR: SPIE
CONFERENCE LOCATION: San Diego, CA
CONFERENCE DATE: Jul 1998 (199807) (199807)

H.236 + I-frame coding with a hybrid DCT / wavelet transform (3460-36)
Song, H.; Kim, J. ; Kuo, C.-C. J.
DESCRIPTORS: digital image processing; image processing; SPIE

?

File 348:EUROPEAN PATENTS 1978-2004/Mar W03

(c) 2004 European Patent Office

File 349:PCT FULLTEXT 1979-2002/UB=20040325,UT=20040318

(c) 2004 WIPO/Univentio

Set	Items	Description
S1	105044	(IMAGE? ? OR PICTURE? ? OR PHOTO? ? OR GRAPHIC? OR PHOTOGR- APH?) (5N) (DIGITAL? OR BINARY? OR OPTICAL? OR ELECTRONIC? OR - COMPUTER?) OR JPG OR JPGS OR JPEGS OR JPEG OR MPEG OR MPEGS OR GIF OR GIFS OR TIFF OR BMP
S2	3273	(WAVELET? ? OR WAVE()LET? ?)
S3	6610	DCT OR DISCRETE()COSINE()TRANSFORM
S4	266244	DIGITAL OR DIGITI? OR BINARY
S5	9809	WATERMARK? OR WATER()MARK? OR COPYRIGHT(W)PROTECT? OR DIG- ITAL(3N) (FINGERPRINT? OR FINGER(W)PRINT?) OR (ID OR IDS OR ID- ENTIFIER? ?) (5N)S4 OR STEGANOGRAPH? OR STEGANO()GRAPH?
S6	7063	S2 OR HAAR
S7	27	S1(S)S3(S)S5(S)S6
S8	27	IDPAT (sorted in duplicate/non-duplicate order)
S9	27	IDPAT (primary/non-duplicate records only)
S10	19	S9 AND AD=19980910:20020101/PR
S11	1	S9 AND AD=20020101:20040331/PR
S12	8	S9 NOT (S10 OR S11)
S13	75	S3(S)S5(S)S6
S14	75	IDPAT (sorted in duplicate/non-duplicate order)
S15	75	IDPAT (primary/non-duplicate records only)
S16	4	S15 AND AD=20020101:20040331/PR
S17	60	S15 AND AD=19980910:20020101/PR
S18	6	S15 NOT (S16 OR S17 OR S12)
S19	667	S3(S)S6
S20	32	S19 AND IC=G06K-009/00
S21	32	IDPAT (sorted in duplicate/non-duplicate order)
S22	32	IDPAT (primary/non-duplicate records only)
S23	23	S22 AND AD=19980910:20020101/PR
S24	4	S22 AND AD=20020101:20040331/PR
S25	5	S22 NOT (S23 OR S24 OR S12 OR S18)

12/3,K/1 (Item 1 from file: 348)
DIALOG(R) File 348:EUROPEAN PATENTS
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01651931

Moving image recording apparatus/method
Bewegtbillaufzeichnungsgerat und -verfahren
Methode et appareil d'enregistrement d'image animee
PATENT ASSIGNEE:

FUJITSU LIMITED, (211463), 1-1, Kamikodanaka 4-chome, Nakahara-ku,
Kawasaki-shi, Kanagawa 211-8588, (JP), (Applicant designated States:
all)

INVENTOR:

Itoh, Hiroyasu, c/o Fujitsu Limited, 1-1, Kamikodanaka 4-chome,
Nakahara-ku, Kawasaki-shi, Kanagawa 211, (JP)
Akiyama, Ryota, c/o Fujitsu Limited, 1-1, Kamikodanaka 4-chome,
Nakahara-ku, Kawasaki-shi, Kanagawa 211, (JP)
Nakagawa, Toru, c/o Fujitsu Limited, 1-1, Kamikodanaka 4-chome,
Nakahara-ku, Kawasaki-shi, Kanagawa 211, (JP)

LEGAL REPRESENTATIVE:

Stebbing, Timothy Charles et al (59643), Haseltine Lake, Imperial House,
15-19 Kingsway, London WC2B 6UD, (GB)

PATENT (CC, No, Kind, Date): EP 1359541 A2 031105 (Basic)

APPLICATION (CC, No, Date): EP 2003015544 980330;

PRIORITY (CC, No, Date): JP 97235069 970829; JP 97237518 970902

DESIGNATED STATES: DE; FR; GB

RELATED PARENT NUMBER(S) - PN (AN):

EP 899688 (EP 98302407)

INTERNATIONAL PATENT CLASS: G06T-001/00

ABSTRACT WORD COUNT: 62

NOTE:

Figure number on first page: 3

LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200345	397
SPEC A	(English)	200345	21138
Total word count - document A			21535
Total word count - document B			0
Total word count - documents A + B			21535

...SPECIFICATION watermark information in the principal parts of the content is made small. Thus, the watermark information is embedded inconspicuously.

There are also different schemes wherein **watermark** information is embedded by utilizing the existing techniques for image bandwidth compression. By way of example, Fraunhofer CRCG (in U. S.) has developed the scheme wherein, in embedding the **watermark** information in the process of the compression of the **JPEG**, that is, at the stage of linear quantization, a medium frequency coefficient among **DCT** output coefficients is varied, and the variation is used as the **watermark** information. Besides, NTT (in Japan) or NEC (in Japan) has developed the scheme wherein, when the conversion coefficient of **DCT** is to be linearly quantized, a coefficient value is changed little by little so as to form the **watermark** information. In addition, Mitsubishi Denki (in Japan) is developing conjointly with Kyushu University (in Japan), electronic **watermarking** which employs **wavelet** conversion. Kyoto Institute of Technology (in Japan) has proposed the scheme wherein the

watermark information is embedded in the moving vectors of **MPEG** .
Concretely, a table in which the **watermark** bits of 100 bits are held in
correspondence with the individual moving vectors existent in the number
of 330 per frame, is prepared as secret information at each of
transmission and reception ends. It is secretly utilized as a code table
to check whether the **watermark** information is true or false.

Straightforwardly, problems related to the present invention are stated
in the Call for Proposals made by the CPTWG/DHSG. In...

12/3,K/2 (Item 2 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS
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01121279
Digital watermarking and methods for security documents
Erzeugung von digitalen Wasserzeichen und Verfahren fur
Sicherheitsdokumente
Formation de filigranes numeriques et methodes pour documents de securite
PATENT ASSIGNEE:

Digimarc Corporation, (2160504), 19801 SW 72nd Avenue, Suite 250,
Tualatin, Oregon 97062, (US), (Applicant designated States: all)

INVENTOR:
Rhoads, Geoffrey B., 304 sw Tualatin Loop, West Linn, Oregon 97068, (US)
LEGAL REPRESENTATIVE:

Meddle, Alan Leonard et al (33761), FORRESTER & BOEHMERT
Franz-Joseph-Strasse 38, 80801 Munchen, (DE)

PATENT (CC, No, Kind, Date): EP 981113 A2 000223 (Basic)
EP 981113 A3 010314

APPLICATION (CC, No, Date): EP 99113163 990707;

PRIORITY (CC, No, Date): US 127502 980731

DESIGNATED STATES: AT; BE; CH; CY; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI;
LU; MC; NL; PT; SE

EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI

INTERNATIONAL PATENT CLASS: G07D-007/00; G07D-007/12; H04N-001/32;

B42D-015/00

ABSTRACT WORD COUNT: 187

NOTE:

Figure number on first page: 12

LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200008	542
SPEC A	(English)	200008	8803
Total word count - document A			9345
Total word count - document B			0
Total word count - documents A + B			9345

...SPECIFICATION documents. However, it should be recognized that the
principles discussed below can also be applied outside this area.

Most of the prior art in image **watermarking** has focused on pixelated
imagery (e.g. bit-mapped images, **JPEG / MPEG** imagery, VGA/SVGA display
devices, etc.). In most **watermarking** techniques, the luminance or color
values of component pixels are slightly changed to effect subliminal
encoding of **binary** data through the **image** . (This encoding can be done
directly in the pixel domain, or after the signal has been processed and
represented differently - e.g. as **DCT** or **wavelet** coefficients, or as
compressed data, etc.)

While pixelated imagery is a relatively recent development, security

documents --commonly employing line art -- go back centuries. One familiar...

12/3,K/3 (Item 3 from file: 348)
DIALOG(R) File 348:EUROPEAN PATENTS
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01003410
Method for generating digital watermarks and for exchanging data containing digital watermarks

Verfahren zur Erzeugung von digitalen Wasserzeichen und zum Austausch von digitale Wasserzeichen enthaltenden Daten

Procede de generation de filigrames numeriques et d'echange de donnees comportant des filigrames

PATENT ASSIGNEE:

Digital Copyright Technologies AG, (2610630), Stauffacherstrasse 149,
8004 Zurich, (CH), (applicant designated states:
AT;BE;CH;DE;DK;ES;FI;FR;GB;GR;IE;IT;LI;LU;MC;NL;PT;SE)

INVENTOR:

Herrigel, Alexander, Bergstrasse 62, 8706 Meilen, (CH)
Oruanaidh, Joseph J.K., Studio 11, Rue Jacques Dalphin 11, Carouge, 1227
Geneve, (CH)
Pun, Thierry, 60 Chemin de la Gradelle, 1224 Chene-Bougeries, (CH)

LEGAL REPRESENTATIVE:

Blum, Rudolf Emil Ernst et al (24791), c/o E. Blum & Co Patentanwalte
Vorderberg 11, 8044 Zurich, (CH)

PATENT (CC, No, Kind, Date): EP 905967 A1 990331 (Basic)

APPLICATION (CC, No, Date): EP 97810708 970926;

PRIORITY (CC, No, Date): EP 97810708 970926

DESIGNATED STATES: AT; BE; CH; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI; LU;
MC; NL; PT; SE

INTERNATIONAL PATENT CLASS: H04N-001/32;

ABSTRACT WORD COUNT: 154

LANGUAGE (Publication,Procedural,Application): English; English; English

FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	9913	1292
SPEC A	(English)	9913	8684
Total word count - document A			9976
Total word count - document B			0
Total word count - documents A + B			9976

...SPECIFICATION spread spectrum communication for multimedia", Technical report, N.E.C. Research Institute, 1995). Early methods of encoding watermarks consisted of no more than incrementing an image component to encode a binary '1' and decrementing to encode a '0' (G. Caronni "Assuring Ownership Rights for Digital Images " in H. H. Brueggemann and W. Gerhardt-Haeckl, editors, Reliable IT Systems VIS '95, Vieweg Publishing Company, Germany, 1995). Tirkel et al. (A. Z. Tirkel, G. A. Rankin, R. G. van Schyndel, W. J. Ho, N. R. A. Mee, and C. F. Osborne, "Electronic watermark ", in Dicta-93, pages 666-672, Macquarie University, Sydney, December 1993) and van Schyndel et al. (A. Z. Tirkel, R. G. van Schyndel, and C. F. Osborne, "a two-dimensional digital watermark ", in ACCV'95, pages 378-383, University of Queensland, Brisbane, December 6-8 1995) have applied the properties of m-sequences to produce oblivious watermarks resistant to filtering, cropping and reasonably robust to cryptographic attack. Matsui and Tanaka (K. Matsui and K. Tanaka, "Video- Steganography : How to secretly embed a signature

in a picture", in IMA Intellectual Property Project Proceedings, pages 187-206, January 1994) have applied linear predictive coding for **watermarking**. Their approach to hiding a **watermark** is to make the **watermark** resemble quantization noise. Tirkel and Osborne (see above) were the first to note the applicability of spread spectrum techniques to **digital image watermarking**. Since then there has been an increasing use of spread spectrum in **digital watermarking**. It has several advantageous features, such as cryptographic security (see Tirkel and Osborne, above), and is capable of achieving error free transmission of the **watermark** near or at the limits given by the maximum channel capacity (J. Smith and B. Comiskey, "Modulation and information hiding in images", in Ross Anderson...

...Springer). Fundamental information theoretic limits to reliable communication have been discussed by some authors (see Smith and Comiskey, above). The shorter the payload of a **watermark**, the better are the chances of it being communicated reliably. Spread spectrum is an example of a symmetric key cryptosystem (B. Schneier, "Applied Cryptography", Wiley...

...1995). System security is based on proprietary knowledge of the keys (or pseudo random seeds) which are required to embed, extract or remove an **image watermark**. One provision in the use of a spread spectrum system is that it is important that the **watermarking** be non-invertible because only in this way can true ownership of the copyright material be resolved (S. Craver, N. Memon, B. Yeo, and M...

...Storage and Retrieval of Image and Video Databases", 1997). O Ruanaidh et al. (J. K. O Ruanaidh, W. J. Dowling, and F. M. Boland, "Phase **watermarking** of images", IEEE International Conference on Image Processing, Lausanne, Switzerland, September 1996) and Cox et al. (see above) have developed perceptually adaptive transform domain methods for **watermarking**. In contrast to previous approaches listed above the emphasis was on embedding the **watermark** in the most significant components of an image. The general approach used in these papers is to divide the image into blocks. Each block is mapped into the transform domain using either the **Discrete Cosine Transform** (W. B. Pennebaker and J. L. Mitchell, "JPEG Still Image Compression Standard", Van Nostrand Reinhold, New York, 1993), the Hadamard Transform (W. G. Chambers, "Basics of Communications and Coding", Oxford Science Publications, Clarendon Press Oxford, 1985) or the Daubechies **Wavelet** Transform (W.H. Press, S.A. Teukolsky, W.T. Vetterling, and B.P. Flannery, "Numerical Recipes in C", Cambridge University Press, second edition, 1992). Information has been embedded using the **DCT** (J. J. K. O Ruanaidh, W. J. Dowling, and F. M. Boland, " **Watermarking digital images for copyright protection** ", IEEE Proceedings on Vision, Image and Signal Processing, 143(4) :250-256, August 1996, based on the paper of the same title at the IEEE Conference on Image Processing and Its Applications, Edinburgh, July 1995) FFT magnitude, and phase, **Wavelets** (see refs. of Ruanaidh, Dowling and Boland, above), Linear Predictive Coding (see Matsui et al., above) and fractals (P. Davern and M. Scott, "Fractal based image **steganography** ", in Ross Anderson, ed., Proceedings of the First International Workshop in Information Hiding, Lecture Notes in Computer Science, pp. 279-294, Cambridge, UK, May/June...

12/3,K/4 (Item 4 from file: 348)
DIALOG(R) File 348:EUROPEAN PATENTS
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00995264

Device for generating, detecting, recording, and reproducing a watermarked moving image

Gerat zum Erzeugen, Detektieren, Aufzeichnen und Wiedergeben eines Wasserzeichen-Bewegtbildes

Dispositif de generation, detection, enregistrement et de reproduction d'images filigrane mouvantes

PATENT ASSIGNEE:

FUJITSU LIMITED, (211463), 1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki-shi, Kanagawa 211-8588, (JP), (Applicant designated States: all)

INVENTOR:

Itoh, Hiroyasu, c/o Fujitsu Limited, 1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki-shi, Kanagawa 211-8588, (JP)
Akiyama, Ryota, c/o Fujitsu Limited, 1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki-shi, Kanagawa 211-8588, (JP)
Nakagawa, Toru, c/o Fujitsu Limited, 1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki-shi, Kanagawa 211-8588, (JP)

LEGAL REPRESENTATIVE:

Stebbing, Timothy Charles et al (59641), Haseltine Lake & Co., Imperial House, 15-19 Kingsway, London WC2B 6UD, (GB)

PATENT (CC, No, Kind, Date): EP 899688 A2 990303 (Basic)
EP 899688 A3 010124

APPLICATION (CC, No, Date): EP 98302407 980330;

PRIORITY (CC, No, Date): JP 97235069 970829; JP 97237518 970902

DESIGNATED STATES: DE; FR; GB

EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI

RELATED DIVISIONAL NUMBER(S) - PN (AN):

(EP 2003015544)

INTERNATIONAL PATENT CLASS: G06T-011/00; G06T-001/00

ABSTRACT WORD COUNT: 160

NOTE:

Figure number on first page: 2

LANGUAGE (Publication,Procedural,Application): English; English; English

FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	9909	1178
SPEC A	(English)	9909	21221
Total word count - document A			22399
Total word count - document B			0
Total word count - documents A + B			22399

...SPECIFICATION watermark information in the principal parts of the content is made small. Thus, the watermark information is embedded inconspicuously.

There are also different schemes wherein **watermark** information is embedded by utilizing the existing techniques for image bandwidth compression. By way of example, Fraunhofer CRCG (in U. S.) has developed the scheme wherein, in embedding the **watermark** information in the process of the compression of the **JPEG**, that is, at the stage of linear quantization, a medium frequency coefficient among **DCT** output coefficients is varied, and the variation is used as the **watermark** information. Besides, NTT (in Japan) or NEC (in Japan) has developed the scheme wherein, when the conversion coefficient of **DCT** is to be linearly quantized, a coefficient value is changed little by little so as to form the **watermark** information. In addition, Mitsubishi Denki (in Japan) is developing conjointly with Kyushu University (in Japan), electronic **watermarking** which employs **wavelet** conversion. Kyoto Institute of Technology (in Japan) has proposed the scheme wherein the **watermark** information is embedded in the moving vectors of **MPEG**. Concretely, a table in which the **watermark** bits of 100 bits are held in

correspondence with the individual moving vectors existent in the number of 330 per frame, is prepared as secret information at each of transmission and reception ends. It is secretly utilized as a code table to check whether the watermark information is true or false.

Straightforwardly, problems related to the present invention are stated in the Call for Proposals made by the CPTWG/DHSG. In...

12/3,K/5 (Item 1 from file: 349)
DIALOG(R) File 349:PCT FULLTEXT
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00549763 **Image available**
WATERMARKING SYSTEM AND METHODOLOGY FOR DIGITAL MULTIMEDIA CONTENT
SYSTEME DE FORMATION DE FILIGRANE ET METHODOLOGIE DESTINEE A UN CONTENU
MULTIMEDIA NUMERIQUE

Patent Applicant/Assignee:

DIGITAL VIDEO EXPRESS L P,
IU Siu-Leong,
DAVIS Malcom,
LUO Hui,
LIN Yun-Ting,
MERCIER Guillaume,
BUGWADIA Kobad,

Inventor(s):

IU Siu-Leong,
DAVIS Malcom,
LUO Hui,
LIN Yun-Ting,
MERCIER Guillaume,
BUGWADIA Kobad,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200013136 A1 20000309 (WO 0013136)
Application: WO 99US19723 19990831 (PCT/WO US9919723)
Priority Application: US 9898687 19980831

Designated States: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK
EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS
LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR
TT UA UG US UZ VN YU ZA ZW GH GM KE LS MW SD SL SZ UG ZW AM AZ BY KG KZ
MD RU TJ TM AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ
CF CG CI CM GA GN GW ML MR NE SN TD TG

Publication Language: English

Fulltext Word Count: 24626

Fulltext Availability:

Detailed Description

Detailed Description

... techniques that operate in the spatial domain on uncompressed video can protect the video at these outputs and are viable for such devices.

Transform domain watermarking techniques often have high complexity. Usually, a DCT, FFT, or wavelet transform of an entire image and its inverse is computed. The computational burden is substantial. If the watermark needs to be added to an MPEG bitstream, decoding and reencoding also are required. Despite the high complexity, transform domain techniques are the most common approach to watermarking (at least, when computational complexity is not an issue). The relevance of these transforms, especially the DCT and wavelet, to human perception is a major reason for this popularity. Another reason is that these

transforms are natural operating domains for spread spectrum techniques. The **MPEG** bitstream format does not impose any constraints in the transform domain. It is possible, however, for some transform domain techniques to take advantage of the 8x8 DCTs in the **MPEG** bitstream.

The method of Swanson, Zhu, and Tewfik is an interesting example of a transform domain technique. The (uncompressed) video to be watermarked is segmented...OPIMA terminal, would need to insert the tracing watermarks into content.

If one surveys current waterinarking techniques, the idea of a consumer electronics device inserting **watermarks** into video in real-time appears impractical at first because of the complexity involved and the large amount of computation required. These techniques commonly perform video scene analysis, compute frequency transforms (e.g., the **DCT**, **FFT**, or **wavelet** transform) on large parts of the video, and invoke models of human perception. In addition, most techniques operate on uncompressed video whereas most consumer electronics devices receive compressed video (e.g., an **MPEG** bitstream). A few **watermarking** techniques operate on an **MPEG** bitstream by modifying the coefficients of the 8x8 **DCT** blocks [3,4]. In this case, the VLCs (Huffman codes) are decoded, inverse quantization is performed to get the **DCT** coefficients, the **DCT** coefficients are modified to introduce the **watermarks**, the modified coefficients are quantized, and replacement VLCs are generated by Huffman encoding the **DCT** coefficients. The complexity and computation required to do all this in real-time is substantial.

A more realistic alternative is to insert waten-narks by...

12/3,K/6 (Item 2 from file: 349)
DIALOG(R) File 349:PCT FULLTEXT
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00543983

DIGITAL WATERMARKS AND METHODS FOR SECURITY DOCUMENTS

FILIGRANES NUMERIQUES ET PROCEDES POUR DOCUMENTS DE SECURITE OU ANALOGUES

Patent Applicant/Assignee:

DIGIMARC CORPORATION,
RHOADS Geoffrey B,

Inventor(s):

RHOADS Geoffrey B,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200007356 A2 20000210 (WO 0007356)

Application: WO 99US14532 19990624 (PCT/WO US9914532)

Priority Application: US 98127502 19980731

Designated States: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE

ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT

LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT

UA UG US UZ VN YU ZA ZW GH GM KE LS MW SD SL SZ UG ZW AM AZ BY KG KZ MD

RU TJ TM AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF

CG CI CM GA GN GW ML MR NE SN TD TG

Publication Language: English

Fulltext Word Count: 10321

Fulltext Availability:.

Detailed Description

Detailed Description

... documents. However, it should be recognized that the principles discussed below can also be applied outside this area.

Most of the prior art in image **watermarking** has focused on pixelated imagery (e.g. bit-mapped images, **JPEG / MPEG** imagery, VGA/SVGA display devices, etc.). In most watermarking techniques, the luminance or color values of component pixels are slightly changed to effect subliminal encoding of **I O binary** data through the **image**. (This encoding can be done directly in the pixel domain, or after the signal has been processed and represented differently - e.g. as **DCT** or **wavelet** coefficients, or as compressed data, etc.) While pixelated imagery is a relatively recent development, security documents -- commonly employing line art -- go back centuries. One familiar...

12/3,K/7 (Item 3 from file: 349)
DIALOG(R) File 349:PCT FULLTEXT
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00447049 **Image available**

INVISIBLE DIGITAL WATERMARKS
FILIGRANES NUMERIQUES INVISIBLES

Patent Applicant/Assignee:

TELSTRA R & D MANAGEMENT PTY LTD,
JOHNSON Andrew,
BIGGAR Michael,

Inventor(s):

JOHNSON Andrew,
BIGGAR Michael,

Patent and Priority Information (Country, Number, Date):

Patent: WO 9837513 A1 19980827

Application: WO 98AU106 19980220 (PCT/WO AU9800106)

Priority Application: AU 975218 19970220

Designated States: AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES
FI GB GE GH GM GW HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD
MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US
UZ VN YU ZW GH GM KE LS MW SD SZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE
CH DE DK ES FI³ FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN ML
MR NE SN TD TG

Publication Language: English

Fulltext Word Count: 7125

Fulltext Availability:

Detailed Description

Detailed Description

... rectangular blocks, and each block is then transformed using either a Walsh transform, discrete cosine transform (DCT) or wavelet transform. The bits defining the watermark **graphic** are inserted in the **digital image** by incrementing or decrementing a selected coefficient in the transform domain of the data block. Coefficients are selected according to a criterion based on energy content. Another algorithm described in the article relates to insertion of **watermark** data based on the use of the discrete Fourier transform (DFT). This method differs fundamentally from the transform domain technique outlined above. The DFT is a complex transform that generates complex transform domain coefficients given a real valued input. The **watermark** is placed in the phase component of generated transform coefficients when using this transform.

Another article which addresses the difficult issues of digital

watermarking is...

12/3,K/8 (Item 4 from file: 349)
DIALOG(R) File 349:PCT FULLTEXT
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00437046 **Image available**

COMPRESSION EMBEDDING

INTEGRATION POUR LA COMPRESSION

Patent Applicant/Assignee:

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA,
SANDFORD Maxwell T II,
HANDEL Theodore G,
BRADLEY Jonathan N,

Inventor(s):

SANDFORD Maxwell T II,
HANDEL Theodore G,
BRADLEY Jonathan N,

Patent and Priority Information (Country, Number, Date):

Patent: WO 9827510 A1 19980625

Application: WO 97US23291 19971216 (PCT/WO US9723291)

Priority Application: US 96772188 19961219

Designated States: AL AM AT AU AZ BB BG BR BY CA CH CN CZ DE DK EE ES FI GB

GE HU IL IS JP KE KG KP KR KZ LK LR LS LT LU LV MD MG MK MN MW MX NO NZ

PL PT RO RU SD SE SG SI SK TJ TM TR TT UA UG UZ VN GH GM KE LS MW SD SZ

UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE CH DE DK ES FI FR GB GR IE IT LU

MC NL PT SE BF BJ CF CG CI CM GA GN ML MR NE SN TD TG

Publication Language: English

Fulltext Word Count: 10233

Fulltext Availability:

Detailed Description

Detailed Description

... images compressed with lossy methods.

Redundancy and uncertainty are intrinsic to lossy compression methods. Two examples of lossy compression are the Joint Photographic Experts Group (JPEG) standard, and the Wavelet Scalar Quantization (WSQ) algorithm that has been adopted by the Federal Bureau of Investigation for the electronic interchange of digital fingerprint information. A similar compression standard established by the Moving Picture Experts Group (MPEG) is used for digital television and multi-media imagery. The JPEG and MPEG algorithms are based on the Discrete Cosine Transform (DCT) representation of the host data. The WSQ method is based on a representation of the host data in terms of wavelet functions. In the methods, the host data representation exists in an intermediate stage as a sequence of blocks of integer values referred to as 'indices'...

...fidelity occurs because the 15 transform coefficients that represent the original data are quantized to a finite number of integer representations. The above mentioned JPEG , WSQ, and MPEG methods apply some form of loss-less compression to the integer coefficient blocks, resulting in doubly compressed data approximating the original image.

In the normal...

?

18/3,K/1 (Item 1 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS
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01093337

Digital watermarking and banknotes

Erzeugung von digitalen Wasserzeichen und Banknoten

Formation de filigranes numeriques et de billets de banque

PATENT ASSIGNEE:

Digimarc Corporation, (2160504), 19801 SW 72nd Avenue, Suite 250,
Tualatin, Oregon 97062, (US), (Applicant designated States: all)

INVENTOR:

Rhoads, Geoffrey B., 304 SW Tualatin Loop, West Linn Oregon 97068, (US)

LEGAL REPRESENTATIVE:

Meddle, Alan Leonard (33761), FORRESTER & BOEHMERT Franz-Joseph-Strasse
38, 80801 Munchen, (DE)

PATENT (CC, No, Kind, Date): EP 961239 A2 991201 (Basic)
EP 961239 A3 010228

APPLICATION (CC, No, Date): EP 99107280 990414;

PRIORITY (CC, No, Date): US 82228 980416; US 74034 980506

DESIGNATED STATES: AT; BE; CH; CY; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI;
LU; MC; NL; PT; SE

EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI

INTERNATIONAL PATENT CLASS: G07D-007/00; G07D-007/12; H04N-001/32;
B42D-015/00

ABSTRACT WORD COUNT: 197

NOTE:

Figure number on first page: 9

LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	9948	1273
SPEC A	(English)	9948	7547
Total word count - document A			8820
Total word count - document B			0
Total word count - documents A + B			8820

...SPECIFICATION the line is made wider (i.e. more ink).

Whether the luminance in a given region should be increased or decreased depends on the particular watermarking algorithm used. Any algorithm can be used, by changing the luminosity of regions 12 as the algorithm would otherwise change the luminance or colors of pixels in a pixelated image. (Some watermarking algorithms effect their changes in a transformed domain, such as DCT, wavelet, or Fourier. However, such changes are ultimately manifested as changes in luminance or color.)

In an exemplary algorithm, the binary data is represented as a...

18/3,K/2 (Item 2 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS
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00983445

Apparatus and method for watermark data insertion and apparatus and method
for watermark data detection

Wasserzeichendateneinfugensvorrichtung und -Verfahren und Wasserzeichendate
nerkennungsvorrichtung und -Verfahren

Dispositif et procede d'insertion de donnees de filigrane et dispositif et

procede pour la detection de donnees de filigrane

PATENT ASSIGNEE:

Matsushita Electric Industrial Co., Ltd., (1855508), 1006, Oaza-Kadoma,
Kadoma-shi, Osaka 571-8501, (JP), (applicant designated states:
AT;BE;CH;CY;DE;DK;ES;FI;FR;GB;GR;IE;IT;LI;LU;MC;NL;PT;SE)

INVENTOR:

Senoh, Takanori, 1-24-8, Higashinakaburi, Hirakata-shi, Osaka, (JP)

LEGAL REPRESENTATIVE:

Schwabe - Sandmair - Marx (100951), Stuntzstrasse 16, 81677 Munchen, (DE)

PATENT (CC, No, Kind, Date): EP 891071 A2 990113 (Basic)

EP 891071 A3 990721

APPLICATION (CC, No, Date): EP 98112561 980707;

PRIORITY (CC, No, Date): JP 97183429 970709

DESIGNATED STATES: DE; FR; GB; IT

INTERNATIONAL PATENT CLASS: H04N-001/32;

ABSTRACT WORD COUNT: 153

LANGUAGE (Publication,Procedural,Application): English; English; English

FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	9902	1052
SPEC A	(English)	9902	5474
Total word count - document A			6526
Total word count - document B			0
Total word count - documents A + B			6526

...SPECIFICATION copying of such works in the field of digital contents
containing images and/or sounds.

In accordance with one embodiment of the present invention, a **wavelet**
transform encompasses the pixel information of the entire single frame
regardless of the subband that is being used. Therefore, **watermark** data
can be easily embedded in the entire image through one **watermark** data
insertion process. The method of the present invention also prevents
block distortion, which is typically observed in **DCT** transform.

In accordance with one embodiment of the present invention, watermark
data is inserted with its amplitude being adjusted in accordance with the
luminance values...

18/3,K/3 (Item 3 from file: 348)

DIALOG(R)File 348:EUROPEAN PATENTS

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00921325

Digital data watermarking

Erzeugung von Wasserzeichen fur digitalen Daten

Formation de filigranes dans des donnees numeriques

PATENT ASSIGNEE:

NEC CORPORATION, (236690), 7-1, Shiba 5-chome, Minato-ku, Tokyo, (JP),
(Applicant designated States: all)

INVENTOR:

Cox, Ingemar J., 21 LeParc Drive, Lawrenceville, NJ 08648, (US)

Miller, Matthew L., Ligonines 6-8, Vilnius, (LT)

Tanaka, Kazuyoshi, c/o NEC Corporation, 7-1 Shiba 5-chome, Minato-ku,
Tokyo, (JP)

Wakasu, Yutaka, c/o NEC Corporation, 7-1 Shiba 5-chome, Minato-ku, Tokyo,
(JP)

LEGAL REPRESENTATIVE:

VOSSIUS & PARTNER (100314), Siebertstrasse 4, 81675 Munchen, (DE)

PATENT (CC, No, Kind, Date): EP 840513 A2 980506 (Basic)

EP 840513 A3 000524
APPLICATION (CC, No, Date): EP 97119231 971104;
PRIORITY (CC, No, Date): US 746022 961105
DESIGNATED STATES: DE; FR; GB; NL
EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI
INTERNATIONAL PATENT CLASS: H04N-007/24; H04N-001/32; H04N-007/30
ABSTRACT WORD COUNT: 37
NOTE:

Figure number on first page: 2

LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	9819	1019
SPEC A	(English)	9819	5258
Total word count - document A			6277
Total word count - document B			0
Total word count - documents A + B			6277

...SPECIFICATION mapper 11 is provided to a spectral transformer 12, which converts the pseudo-random noise sequence into the frequency domain. The conversion preferably is by **discrete cosine transform (DCT)**, however, fast fourier transform, **wavelet** type decomposition and the like may also be used for frequency conversion. Concurrently, the data to be **watermarked** is provided to another spectral transformer 13. ...as inputs to a spectral shaper 14, which modifies the spectral properties of the pseudo-random noise codes from spectral transformer 12 to mask the **watermark** when added to the image data The spectrally transformed data to be **watermarked**, from spectral transformer 13, is also provided as an input to a delay 15. The output of the spectral shaper 14 is then added to...

...output of delay 15 at a summer 16. The summer output is subject to an inverse transform 17. The result of the inverse transform is **watermarked** data.

INSERT-MPEG-A differs from INSERT-WHOLE by segmenting the data to be watermarked into multiple blocks, such as 8x8 pixel subimages or subregions...

18/3,K/4 (Item 1 from file: 349)
DIALOG(R) File 349:PCT FULLTEXT
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00532153 **Image available**

METHOD FOR DATA PREPARATION AND WATERMARK INSERTION
PROCEDE DE PREPARATION DE DONNEES ET D'INSERTION DE FILIGRANES

Patent Applicant/Assignee:

SIGNAFY INC,

Inventor(s):

BLOOM Jeffrey A,
COX Ingemar J,
MILLER Matthew L,

Patent and Priority Information (Country, Number, Date):

Patent: WO 9963505 A1 19991209

Application: WO 99US8216 19990416 (PCT/WO US9908216)

Priority Application: US 9892431 19980605

Designated States: CA JP AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT
SE

Publication Language: English

Fulltext Word Count: 6072

Fulltext Availability:

Detailed Description

Detailed Description

... data 6 will be sufficiently similar to the signal derived from the watermark pattern 5 to indicate a positive detection decision.

Insertion of the first **watermark** involves a modification of the unwatermarked data such that a set of data characteristics, or a signal derived from a set of data characteristics, will closely match a known **watermark** signal, alternately referred to as a signal derived from a set of characteristics of a **watermark0** pattern. The set of data characteristics considered may be derived from the data in the spatial domain, the temporal domain, and/or a transformed domain...

...which data characteristics can be derived. In the preferred embodiment, the data characteristics are derived from the data in both the spatial and the block **DCT** domains. Other local transform domains such as block Fourier transform, Hadamard transform, cortex transform, and **wavelets** as well as global transform domains such as the **DCT** and Fourier transform may be used. Spatial and temporal domain characteristic that can be used include sample value, edge features, color characteristics, textures, and phonemes...

18/3,K/5 (Item 2 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

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00532091 **Image available**

METHODS FOR EMBEDDING IMAGE, AUDIO AND VIDEO WATERMARKS IN DIGITAL DATA
PROCEDES PERMETTANT D'INTEGRER DES FILIGRANES DE TYPE IMAGES, AUDIO ET
VIDEO DANS DES DONNEES NUMERIQUES

Patent Applicant/Assignee:

DATAMARK TECHNOLOGIES PTE LTD,
HO Anthony Tung Shuen,
TAM Siu Chung,

Inventor(s):

HO Anthony Tung Shuen,
TAM Siu Chung,

Patent and Priority Information (Country, Number, Date):

Patent: WO 9963443 A1 19991209

Application: WO 98SG39 19980601 (PCT/WO SG9800039)

Priority Application: WO 98SG39 19980601

Designated States: AU CA CN ID JP KR SG US AT BE CH CY DE DK ES FI FR GB GR
IE IT LU MC NL PT SE

Publication Language: English

Fulltext Word Count: 9219

Fulltext Availability:

Detailed Description

Claims

English Abstract

A method for embedding an entire image, audio or video **watermark** sequence within another image, audio or video data sequence with minimum loss of data quality is presented. The method exploits the de-correlation property of data coefficients in the orthogonal transform domain, similar to the application in data compression through transform coding. The present invention describes the usage of a **Discrete Cosine Transform** as the embedding domain. However, other orthogonal transforms such as Fourier, Walsh-Hadamard, **Haar**, Sine and **Wavelet** can also be used for this operation. A unique key derived adaptively from spatial locations registering the thresholds of the ac transform energies is used to unlock or de- **watermark** the embedded image or audio sequence. Moreover, an exponential filter has been developed to compress and expand the **watermark** coefficients prior to the embedding and retrieval process. The method can be used in resolving multimedia **copyright protection** issues arising on the Internet and in the music industry, such as the inclusion of a company's logo or an artist's recorded voice...

Detailed Description

... and

Figure 13 illustrates a block diagram of a personal identification card encoder/decoder.

Detailed description of embodiments of the invention
Embodiments of a digital **watermarking** method will now be described in which 15 the coefficients of a Discrete Cosine Transform (**DCT**) are employed. However, implementations of the invention are not limited solely to the use of **DCT**, and other orthogonal transforms such as discrete Fourier, Walsh-Hadamard, **Haar**, Sine and **Wavelet** transforms can also be used to good effect. In the preferred embodiment, both unlabelled data and **watermark** image data are first converted into two-dimensional matrices and then divided into sub-blocks, prior to orthogonal transformation. The present invention requires that the dimension size of the unlabelled data set must be at least twice the dimension size of the **watermark** data in each dimension, to fulfil a requirement that is closely related to the concept of the Shannon's sampling theorem.

For example, for a...method exploits the de-correlation property of orthogonal transforms for embedding and retrieving digital watermarks.

Although the proposed method describes mainly the use of a **discrete cosine transform** as the domain for **watermarking**; however, orthogonal transforms such as Fourier, Walsh-Hadamard, **Haar**, Sine and **Wavelet** can also be applied. Instead of the current **watermarking** technology of embedding text strings into digital data, the proposed method would provide additional complementary proof as to the true ownership of the digital data...

...a recording of the artist's voice, making a copyright infringement claim easier to substantiate than when just a text string is applied as the **watermark**.

The ability of the proposed method to embed and retrieve an entire audio or imacre watermark is a significant advantage over current prior art techniques...

Claim

... transform is an inverse DCT.

21 The method as claimed in any one of claims 1 to 20, wherein the

orthogonal transform performed on the watermark data is one of. a Discrete Cosine Transform (DCT); a Fourier transform; a Walsh-Hadamard transform; a Haar transform; a sine transform; and a Wavelet transform.

22 The method as claimed in claim 2 1, wherein the orthogonal transform performed on the watermark data is a Discrete Cosine Transform (DCT... data is a DCT.

51 The method as claimed in any one of claims 37 to 50, wherein the inverse orthogonal transform performed on the watermark data is one of- an inverse Discrete Cosine Transform (DCT); an inverse Fourier transform; an inverse WalshHadamard transform; an inverse Haar transform; an inverse sine transform; and an inverse Wavelet transform.

52 The method as claimed in claim 5 1, wherein the inverse orthogonal transfarrn performed on the watermark data is an inverse DCT.
0...

18/3,K/6 (Item 3 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00522076 **Image available**
DIGITAL WATERMARKING AND BANKNOTES
IMPRESSION DE FILIGRANES NUMERIQUES ET BILLETS DE BANQUE
Patent Applicant/Assignee:
DIGIMARC CORPORATION,
RHOADS Geoffrey B,
Inventor(s):
RHOADS Geoffrey B,
Patent and Priority Information (Country, Number, Date):
Patent: WO 9953428 A1 19991021
Application: WO 99US8252 19990414 (PCT/WO US9908252)
Priority Application: US 9882228 19980416; US 9874034 19980506
Designated States: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE
ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT
LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT
UA UG US UZ VN YU ZA ZW GH GM KE LS MW SD SL SZ UG ZW AM AZ BY KG KZ MD
RU TJ TM AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF
CG CI CM GA GN GW ML MR NE SN TD TG
Publication Language: English
Fulltext Word Count: 13915.
Fulltext Availability:
Detailed Description

Detailed Description
... the line is made wider (i.e. more ink).

Whether the luminance in a given region should be increased or decreased depends on the particular watermarking algorithm used. Any algorithm can be used, by changing the luminosity of 10 regions 12 as the algorithm would otherwise change the luminance or colors of pixels in a pixelated image. (Some watermarking algorithms effect their changes in a transformed domain, such as DCT , wavelet , or Fourier. However, such changes are ultimately manifested as changes in luminance or color.)

In an exemplary algorithm. the binary data is represented as a...

25/3,K/1 (Item 1 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS
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00849810

A METHOD OF COMPRESSING A PLURALITY OF VIDEO IMAGES
VERFAHREN ZUR KOMPRESSION MEHRERER VIDEOBILDER
PROCEDE DE COMPRESSION DE PLUSIEURS IMAGES VIDEO
PATENT ASSIGNEE:

Interval Research Corporation, (2003310), Building C, 1801 Page Mill Road
, Palo Alto, CA 94304, (US), (Proprietor designated states: all)

INVENTOR:

Ahmad, Subutai, 946 Colorado Avenue, Palo Alto, CA 94303, (US)

LEGAL REPRESENTATIVE:

Jackson, David Spence et al (32231), REDDIE & GROSE 16, Theobalds Road,
London, WC1X 8PL, (GB)

PATENT (CC, No, Kind, Date): EP 804774 A1 971105 (Basic)
EP 804774 A1 990224
EP 804774 B1 030521
WO 97010564 970320

APPLICATION (CC, No, Date): EP 96931565 960913; WO 96US14722 960913

PRIORITY (CC, No, Date): US 528891 950915

DESIGNATED STATES: AT; BE; CH; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI; LU;
MC; NL; PT; SE

INTERNATIONAL PATENT CLASS: G06K-009/00 ; G06T-009/00

NOTE:

No A-document published by EPO

LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS B	(English)	200321	949
CLAIMS B	(German)	200321	878
CLAIMS B	(French)	200321	999
SPEC B	(English)	200321	4687
Total word count - document A			0
Total word count - document B			7513
Total word count - documents A + B			7513

INTERNATIONAL PATENT CLASS: G06K-009/00 ...

...SPECIFICATION will be seen. the method of the present invention is not limited by the technique of principal component analysis. For example, image values derived by discrete cosine transform , Gabor filters and wavelets can also be used. However, using the method of principal component analysis, one or more parameters is generated. Initially, the discussion will focus on the...

...CLAIMS plurality of video images.

23. A method according to claim 22, characterised in that each video image of the said first plurality is compressed by discrete cosine transform or by Gabor filters or by wavelets .

24. A method according to claim 4, characterised by the steps of comparing each video image with one of the video images having an image...

25/3,K/2 (Item 1 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00474499

**METHOD OF ISOMORPHIC SINGULAR MANIFOLD PROJECTION STILL/VIDEO IMAGERY
COMPRESSION**

**PROCEDE DE COMPRESSION D'IMAGES FIXES/VIDEO PAR PROJECTION MULTIPLE DE
SINGULARITES ISOMORPHES**

Patent Applicant/Assignee:

PHYSICAL OPTICS CORPORATION,

Inventor(s):

KOSTRZEWSKI Andrew,

TERNOVSKIY Igor,

JANNSON Tomasz P,

Patent and Priority Information (Country, Number, Date):

Patent: WO 9905851 A2 19990204

Application: WO 98US15962 19980727 (PCT/WO US9815962)

Priority Application: US 97901832 19970728

Designated States: JP KR AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT
SE

Publication Language: English

Fulltext Word Count: 24363

Main International Patent Class: G06K-009/00

Fulltext Availability:

Detailed Description

Detailed Description

... capacity without information loss.

The vast majority of compression standards in existence today relate to lossy compression. These techniques typically use cosine-type transforms like DCT and wavelet compression, which are specific types of transforms, and have a tendency to lose high frequency information due to limited bandwidth. The "edges" of images typically...compressed separately at step 22.

At step 22, standard lossy texture compression of the newly created frameId is performed by using standard methods such as DCT , wavelet , and fractal. methods.

At step 22, standard additional lossless compression is also performed. The output of step 22 is Id'which then is fed into...

25/3,K/3 (Item 2 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

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00431224 **Image available**

**METHOD AND APPARATUS FOR EFFICIENTLY REPRESENTING, STORING AND ACCESSING
VIDEO INFORMATION**

**PROCEDE ET APPAREIL PERMETTANT DE REPRESENTER, DE METTRE EN MEMOIRE ET
D'ACCEDER DE MANIERE EFFICACE A DES INFORMATIONS VIDEO**

Patent Applicant/Assignee:

SARNOFF CORPORATION,

Inventor(s):

BERGEN James R,

CARLSON Curt,

KUMAR Rakesh,

SAWHNEY Harpreet S,

Patent and Priority Information (Country, Number, Date):

Patent: WO 9821688 A1 19980522
Application: WO 97US20652 19971114 (PCT/WO US9720652)
Priority Application: US 9631003 19961115
Designated States: BR CA CN JP KR MX AT BE CH DE DK ES FI FR GB GR IE IT LU
MC NL PT SE
Publication Language: English
Fulltext Word Count: 12763
Main International Patent Class: G06K-009/00
Fulltext Availability:
Detailed Description

Detailed Description

... values obtained by such subtraction are regarded as residuals. As discussed in U.S. Application No. 08/339,491, foreground residuals may be encoded using **discrete cosine transform (DCT)**, **wavelet** or other compression techniques.

Video scenes may also be represented in terms of "layers." Layers are an extension to the basic mosaic concept for representing...

25/3,K/4 (Item 3 from file: 349)
DIALOG(R) File 349:PCT FULLTEXT
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00394532 **Image available**
REPRESENTATION AND ENCODING OF GENERAL ARBITRARY SHAPES
REPRESENTATION ET CODAGE DE FORMES GENERALES ARBITRAIRES
Patent Applicant/Assignee:
MICROSOFT CORPORATION,
Inventor(s):
CHEN Wei-Ge,
LEE Ming-Chieh,
Patent and Priority Information (Country, Number, Date):
Patent: WO 9735275 A1 19970925
Application: WO 97US4662 19970321 (PCT/WO US9704662)
Priority Application: US 96621120 19960322
Designated States: DE GB JP AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT
SE
Publication Language: English
Fulltext Word Count: 24552

Main International Patent Class: G06K-009/00
Fulltext Availability:
Detailed Description
Detailed Description

... subband (wavelet) compression or encoding as described in Multirate Systems and Filter Banks by Vaidyanathan, PTR Prentice-Hall, Inc., Englewood Cliffs, New Jersey, (1993) or **discrete cosine transform (DCT)** encoding as described in JPEG: Still Image Data Compression Standard by Pennebaker et al., Van Nostrand Reinhold, New York (1993).

As is known in the...indicates that master object 90 is compressed or coded by a conventional I'lossy" still image compression method such as lattice subband (wavelet) compression or **discrete cosine transform (DCT)** encoding. Preferably, function block 132 employs **wavelet** encoding.

Function block 134 indicates that the wavelet encoded master object from function block 132 is further compressed or coded by a conventional I'lossless...process 64 (both of Fig. 3). Extrapolation method 400 allows the compression of function block 112 to be performed in a conventional manner such as DCT or lattice wavelet compression, as described above.

Conventional still image compression methods such a lattice wavelet compression or discrete cosine transforms (DCT) operate upon rectangular arrays of pixels. As described above, however, the methods of the present invention are applicable to image features or objects of arbitrary configuration. Extrapolating such objects or image features to a rectangular pixel array configuration allows use of conventional still image compression methods such as lattice wavelet compression or DCT . Extrapolation method 400 is described below with reference to Figs. 18A-18D, which are representations of display screen 50 on which a simple object 402...providing the encoding described with reference to function block 112 of video compression encoder process 64 shown in Fig.

3, as well as whenever else DCT on wavelet encoding is suggested or used. By way of example, encoder method 500 is described with reference to encoding of estimated error 110 (Fig. 3).

A...dense

motion vector field with its extrapolated regular configuration is encoded or compressed according to conventional encoding transformations such as, for example, discrete cosine transformation (DCT) or lattice wavelet compression, the former of which is preferred.

Function block 568 indicates that the encoded dense motion vector field is further compressed or encoded by a cosine transform (DCT) encoding or lattice subband (wavelet) compression.

Function block 604 indicates that the encoded or compressed quantized objects are stored in a memory buffer (not shown).

Function block 606 indicates that...

...processing a corresponding object in a next successive video frame.

Function block 608 indicates that the encoded quantized object is inverse encoded by, for example, DCT or wavelet decoding according to the encoding processes employed with respect to function block 602.

Codec process 600 allows the capacity of the corresponding memory buffer to...block 112 (Fig. 3A). In the preferred embodiment, the decompression or decoding of function block 728 is by a lattice subband (wavelet) process or a discrete cosine transform (DCT) process.

Function block 722 provides quantized object 730

for frame N as the sum of predicted object 720 and quantized error 724, representing a reconstructed...values for objects of arbitrary configuration to a predefined configuration to facilitate compression or encoding in a conventional manner, such as by discrete cosine transform (DCT) or lattice wavelet compression, as described above.

This combination of hierarchical encoding process 1130 and precompression extrapolation method 400 allows transparency data to be encoded efficiently while maintaining 1172 indicates that the extrapolated transparency data are encoded by an intraframe encoding process such as DCT or lattice wavelet encoding. It will be appreciated, however, that 30 interframe encoding as described above with reference to process 64 can also be applied to the transparency data, resulting in a residual signal that preferably would be encoded by DCT or lattice wavelet encoding.

Encoding process 1160 provides as compressed 35 or encoded data for storage or transmission an encoded boundary representation at process block 1168 and an...

...of the transparency data at process block 1172. Decoding of this information includes conventional intra-frame decoding 5 of the transparency value data (e.g. DCT or wavelet), decoding the boundary information corresponding to the binary transparency objects identified by the threshold filter of process block 1164, and applying the decoded boundary information...

25/3,K/5 (Item 4 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00354421

COMPRESSION EMBEDDING

INTEGRATION DE DONNEES DANS DES DONNEES HOTES COMPRIMEES

Patent Applicant/Assignee:

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA,
SANDFORD Maxwell T II,
HANDEL Theodore G,
BRADLEY Jonathan N,

Inventor(s):

SANDFORD Maxwell T II,
HANDEL Theodore G,
BRADLEY Jonathan N,

Patent and Priority Information (Country, Number, Date):

Patent: WO 9636935 A1 19961121
Application: WO 96US7207 19960517 (PCT/WO US9607207)
Priority Application: US 95442592 19950517

Designated States: AL AM AT AU AZ BB BG BR BY CA CH CN CZ DE DK EE ES FI GB
GE HU IS JP KE KG KP KR KZ LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL
PT RO RU SD SE SG SI SK TJ TM TR TT UA UG US UZ VN KE LS MW SD SZ UG AM
AZ BY KG KZ MD RU TJ TM AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT
SE BF BJ CF CG CI CM GA GN ML MR NE SN TD TG

Publication Language: English

Fulltext Word Count: 5137

Main International Patent Class: G06K-009/00

Fulltext Availability:

Detailed Description

Detailed Description

... adopted by the Federal Bureau of Investigation for the electronic interchange of digital fingerprint information.

The JPEG algorithm is based on the Discrete Cosine Transform (DCT) representation of the host data. The WSQ method is based on a representation of the host data in terms of wavelet functions. In both methods, the host data representation exists in an intermediate stage as a sequence of integer values referred to as 'indices.' At this...embedding process ignores completely the contribution the index values make to the compression representation. In JPEG compression, the values represent the coefficients in a discrete cosine transform performed over pixels in a square block of the image data. Usually, 8x8 pixel blocks are used, but the details of the transform and the tiling of the image data are irrelevant for embedding. In WSQ compression, the indices are determined by quantizing the discrete wavelet transform coefficients which are calculated by repeated applications of a multirate filter bank. 'Again, details of the wavelet calculations and the sampling size are ignored in the selection and use of 5 the embedding pairs.

Depending on the details of the selection algorithm...

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 (c) 1999 Business Wire
 File 813:PR Newswire 1987-1999/Apr 30

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Set	Items	Description
S1	926565	(IMAGE? ? OR PICTURE? ? OR PHOTO? ? OR GRAPHIC? OR PHOTOGRAPH?) (5N) (DIGITAL? OR BINARY? OR OPTICAL? OR ELECTRONIC? OR COMPUTER?) OR JPG OR JPGS OR JPEGS OR JPEG OR MPEG OR MPEGS OR GIF OR GIFS OR TIFF OR BMP
S2	12286	WAVELET? ? OR WAVE()LET? ? OR HAAR
S3	10892	DCT OR DISCRETE()COSINE()TRANSFORM
S4	3805671	DIGITAL OR DIGITI? OR BINARY
S5	93890	WATERMARK? OR WATER()MARK? OR COPYRIGHT(W)PROTECT? OR DIGITAL(3N) (FINGERPRINT? OR FINGER(W)PRINT?) OR (ID OR IDS OR IDENTIFIER? ?) (5N)S4 OR STEGANOGRAPH? OR STEGANO()GRAPH?
S6	2	S1(S)S2(S)S3(S)S5
S7	1	RD S6 (unique items)
S8	1	S7 NOT PY>1998
S9	4	S2(S)S3(S)S5
S10	794	S2(10N)S4
S11	18	S10(S)S3
S12	22	S9 OR S11
S13	16	RD S12 (unique items)
S14	8	S13 NOT PY>1998
S15	8099	AU=(CHOI, J? OR CHOI J? OR KIM, J? OR KIM J? OR CHO, J? OR CHO J? OR LEE, H? OR LEE H?) OR CO=MARKANY
S16	21	S15 AND (S2 OR S3)
S17	4	S16 AND S1
S18	4	RD S17 (unique items)
S19	4	S18 NOT (S8 OR S14)
S20	1	S19 NOT PY>1998

8/3,K/1 (Item 1 from file: 15)
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01663108 03-14098
Protecting digital media content
Memon, Nasir; Wong, Ping Wah
Communications of the ACM v41n7 PP: 34-43 Jul 1998
ISSN: 0001-0782 JRNL CODE: ACM
WORD COUNT: 4301

...TEXT: larger number of bits without incurring noticeable visual artifacts. Such techniques can be employed with common image transforms, such as discrete cosine transforms (DCTs), the **wavelet** transform, and Fourier transforms. A transform-domainbased technique, reported in [12], is tailored to **JPEG** lossy image compression, facilitating insertion of a **watermark** while an image is being compressed. The **watermark** is embedded in the **DCT** coefficients obtained by transforming nonoverlapping 8 X 8 image blocks. The specific blocks are pseudorandomly selected, and specific coefficients from a limited set are then...

?

14/3,K/1 (Item 1 from file: 15)
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01663108 03-14098
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14/3,K/2 (Item 1 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
(c) 2004 The Gale Group. All rts. reserv.

04964376 Supplier Number: 47294311 (USE FORMAT 7 FOR FULLTEXT)
Codecs head for collision
Doherty, Richard
Electronic Engineering Times, p47
April 14, 1997
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 392

(USE FORMAT 7 FOR FULLTEXT)
TEXT:
...watching dozens of hours of digital TV each week-in the sense that most "analog" TV content aired has been squeezed through one or more **digital** codecs. Now, with more **DCT**, **wavelet** and even-fractal based non-linear editing systems influencing the food chain of television video production, what finally gets broadcast is anyone's guess.

14/3,K/3 (Item 1 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
(c)2004 The Gale Group. All rts. reserv.

09437699 SUPPLIER NUMBER: 19288369 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Compression schemes enhance video. (wavelets and fractals) (Emerging markets special report) (Technology Information)
Bindra, Ashok
Electronic Engineering Times, n947, p86(2)
March 31, 1997
ISSN: 0192-1541 LANGUAGE: English RECORD TYPE: Fulltext; Abstract
WORD COUNT: 1225 LINE COUNT: 00108

... tolerance are key advantages of wavelet mathematics, according to Roger Smith, marketing manager for digital video ICs at ADI's Computer Products Division. Compared to **DCT** - (**discrete cosine transform**)

based JPEG and MPEG formats, Smith added, wavelets provide compression ratios as high as 350 to 1, as well as better quality. In fact, he anticipates that wavelets will open a new world of digital video and that a standard image format based on wavelet techniques will evolve in the next few years.

Meanwhile, several developers are adopting wavelet technology using the ADV601 chip. Among them are Quadrant International (Malvern...

14/3,K/4 (Item 2 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
(c)2004 The Gale Group. All rts. reserv.

08976902 SUPPLIER NUMBER: 18660155 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Do-it-yourself wavelet analysis. (includes related article)
McGoldrick, Paul
Electronic Design, v44, n17, p153(2)
August 19, 1996
ISSN: 0013-4872 LANGUAGE: English RECORD TYPE: Fulltext; Abstract
WORD COUNT: 1202 LINE COUNT: 00100

... 1823 by Joseph Fourier in Paris (it therefore seems appropriate that the Wavelet Toolbox was created by a French team in Paris). Conventional techniques of discrete cosine transform (DCT), discrete sine transform (DST) and Hartley transform (HT) are all real-world versions of Fourier. The transform itself doesn't remove any information, it just...

14/3,K/5 (Item 3 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
(c)2004 The Gale Group. All rts. reserv.

08976901 SUPPLIER NUMBER: 18660154 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Video-compression chip is the first to use wavelets.
McGoldrick, Paul
Electronic Design, v44, n17, p150(2)
August 19, 1996
ISSN: 0013-4872 LANGUAGE: English RECORD TYPE: Fulltext; Abstract
WORD COUNT: 1241 LINE COUNT: 00099

... O port (ILLUSTRATION FOR FIGURE 2 OMITTED).
The wavelet kernel gathers statistics on the video on a field basis (unlike the block structure in a DCT process). On the basis of the pre-determined 7,9 coefficients (chosen from research on moving video compression), it calculates forward and backward biorthogonal wavelet...

14/3,K/6 (Item 4 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
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05583439 SUPPLIER NUMBER: 11594980 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Squeezing the image. (image compression)
Causey, Rob
Electronics Weekly, n1570, p18(1)
Oct 16, 1991
ISSN: 0013-5224 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 1473 LINE COUNT: 00114

... new transform uses impulse-like wavelets. The wavelet transform provides a more accurate coding because the wavelets last a finite length of time, whereas the DCT 's cosines theoretically have to go on for ever, which is obviously impossible.

The set of wavelets which describe a particular data stream are stored...

14/3,K/7 (Item 1 from file: 647)
DIALOG(R)File 647:CMP Computer Fulltext
(c) 2004 CMP Media, LLC. All rts. reserv.

01122916 CMP ACCESSION NUMBER: EET19970414S0058
Codecs head for collision (Mediastream)
Richard Doherty
ELECTRONIC ENGINEERING TIMES, 1997, n 949, PG47
PUBLICATION DATE: 970414
JOURNAL CODE: EET LANGUAGE: English
RECORD TYPE: Fulltext
SECTION HEADING: Design
WORD COUNT: 393

TEXT:

... watching dozens of hours of digital TV each week-in the sense that most "analog" TV content aired has been squeezed through one or more digital codecs. Now, with more DCT , wavelet and even-fractal based non-linear editing systems influencing the food chain of television video production, what finally gets broadcast is anyone's guess.

14/3,K/8 (Item 2 from file: 647)
DIALOG(R)File 647:CMP Computer Fulltext
(c) 2004 CMP Media, LLC. All rts. reserv.

01122066 CMP ACCESSION NUMBER: EET19970331S0071
Compression Schemes Enhance Video
Ashok Bindra
ELECTRONIC ENGINEERING TIMES, 1997, n 947, PG86
PUBLICATION DATE: 970331
JOURNAL CODE: EET LANGUAGE: English
RECORD TYPE: Fulltext
SECTION HEADING: Emerging Markets - Communications
WORD COUNT: 1130

... variety of applications, and have been targeted at desktop publishing , presentation graphics and image transmission.

Symmetry, scalability, precision and error tolerance are key advantages of wavelet mathematics, according to Roger Smith, marketing manager for digital video ICs at ADI's Computer Products Division. Compared to DCT - (discrete cosine transform) based JPEG and MPEG formats, Smith added, wavelets provide compression ratios as high as 350 to 1, as well as better quality. In fact, he anticipates that wavelets will open a new world of digital video and that a standard image format based on wavelet techniques will evolve in the next few years.

Meanwhile, several developers are adopting wavelet technology using the ADV601 chip. Among them are Quadrant International (Malvern...
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20/3,K/1 (Item 1 from file: 88)
DIALOG(R)File 88:Gale Group Business A.R.T.S.
(c) 2004 The Gale Group. All rts. reserv.

04692012 SUPPLIER NUMBER: 20438881
DCT coefficients recovery-based error concealment technique and its
application to the MPEG -2 bit stream error.
Park, Jong Wook; Kim, Jong Won ; Lee, Sang Uk
IEEE Transactions on Circuits and Systems for Video Technology, v7, n6,
p845(10)
Dec, 1997
ISSN: 1051-8215 LANGUAGE: English RECORD TYPE: Abstract

DCT coefficients recovery-based error concealment technique and its
application to the MPEG -2 bit stream error.
... Kim, Jong Won

AUTHOR ABSTRACT: This paper presents a novel error concealment technique based on the discrete cosine transform (DCT) coefficients recovery and its application to the MPEG -2 bit stream error. Assuming a smoothness constraint on image intensity, an object function which describes the intersample variations at the boundaries of the lost block and the adjacent blocks is defined, and the corrupted DCT coefficients are recovered by solving a linear equation. Our approach can be regarded as a special case of Wang et al.'s (1). However, we...
...a multistage error detection algorithm. Thus, the proposed EC system can be applied to more realistic environments, such as concealment of random bit error in MPEG -2 bit stream. Computer simulation results show that the quality of a recovered image is significantly improved even at a bit error rate as high as (10^{-5}) . Index Terms - DCT coefficients recovery, error concealment, error detection.
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